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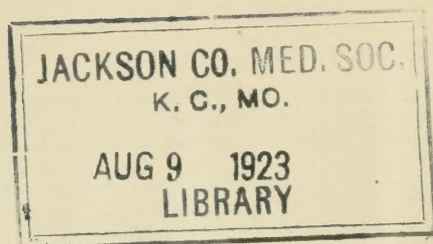
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ORIGINAL COMMUNICATIONS.

UTERINE AND VESICAL PROLAPSE.*

BY

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THE part expected of me in this symposium, I shall assume, is a general analysis of the question by way of introduction to the more detailed observations of other speakers. In the brief time at my disposal only its salient features can be taken up.

Anatomy.—Upon the integrity of the musculo-fibrous framework of the pelvic floor, designed as it is to resist intraabdominal pressure, mainly depends the stability of the female pelvic viscera. I may be pardoned, therefore, for briefly recounting such elementary, anatomic details as have to do with the etiology and treatment of pelvic visceral prolapse.

This framework is made up essentially of the levator ani muscles, their fascial coverings and expansions. The sheaths of the levators are reinforced above by the recto-vesical fascia, and, below, over the anterior half, with which this discussion is most concerned, by the triangular ligament. The basic portion of this complex levator framework is, to all intents and purposes, the pelvic diaphragm. Upon the strength of this, more than all other constituent elements of the pelvic floor, depends the normal relation of the pelvic organs. The superficial musculo-tendinous structures are of minor importance as factors in the supporting power of the floor.

In shape, the levator diaphragm is a transversely flattened

* Read before the New York Obstetrical Society, March 8, 1910.

funnel. This is apparent when we recall that the levators form the inner walls of the ischio-rectal fossæ.

The pubo-coccygei, analogous to the recti abdominis, run from the posterior faces of the pubic bones downward and backward, alongside the vagina and rectum, turning upward behind these viscera to the coccyx. The interval between these muscles, except where traversed by the tubular viscera, is spanned by a fascial bridge, a conjoined tendon not unlike that between the recti abdominis. In this conjoined tendon at the median line are fused the recto-vesical fascia, the sheaths of the pubo-coccygei, the superior layer of the triangular ligament and, at the central perineal tendon, the anterior or inferior layer as well. It is by means of the perineal portion of this fascial bridge between the pubo-coccygei that contraction of the latter muscles lifts the lower end of the vagina and the rectum.

In the erect posture of the woman the coccygeal ends of these two muscles are higher than the pubic. The lowest point of the funnel is the central perineal tendon.

The ilio-coccygei, comparable to the external obliques, sweep from the white lines downward, inward, and backward to the coccyx. The concavity of the diaphragm is thus narrowed transversely from above downward and is narrower anteriorly than posteriorly.

Leaflets from the recto-vesical fascia go to the principal pelvic viscera. They partially ensheathe the bladder and the tubular organs.

Incidentally, it will be seen that the pelvic floor is built on the same general plan as the abdominal wall.

Bladder, urethra, uterus, vagina, and the lower portion of the rectum, that below the coccyx, are all more or less closely related to the levator framework.

By the anterior and the lateral true ligaments, the neck of the bladder is firmly fixed to the recto-vesical fascia immediately behind the pubic bones.

The base of the bladder is held up by the vesico-vaginal leaflet of the latter fascia through its connection with the anterior face of the uterus.

The support of the bladder base depends in part, too, upon the integrity of the entire antero-posterior beam formed by the vesico-vaginal fascia and the utero-sacral ligaments. When the posterior uterine ligaments lose their tone and tension, relaxation of the anterior half of the beam is likely to follow.

Most essential to the stability of the bladder base is the underlying, central, perineal tendon, the chief element in the strength of which is the conjoined tendon of the pubo-coccygei.

The urachus, running into the collapsible upper half of the bladder, has, of course, no real relation to bladder support. As Kelly puts it, the superior half of the empty bladder rests upon the lower as one saucer upon another.

This pelvic organ, then, cannot be said to be suspended in any such sense that its stability is independent of the integrity of the perineum.

The uterus and the larger part of the vagina are only indirectly related to the main fascial sheets of the levator diaphragm. They lie above and behind its anterior half.

The lower part of the posterior vaginal wall is firmly supported by the fascial structures which meet in the perineum, chiefly the conjoined tendon of the pubo-coccygei.

The lower end of the anterior wall also is fixed to the latter tendon.

The fornix is suspended by its attachment to the uterus and by the utero-pelvic ligaments, musculo-fibrous bands in the bases of the broad ligaments.

The fundal extremity of the uterus rests, through the intervention of the bladder, upon the pubic bones and the levator diaphragm.

Its cervical end is in part supported by the vagina and in part is suspended by the utero-sacral and the utero-pelvic ligaments.

The round ligaments are little more than guy lines. They contribute indirectly to the stability of the uterus in so far as they help to hold its axis across that of the vaginal canal.

Nature's plan, therefore, for both bladder and uterus, would seem to be a combination of suspension from above and support from below.

Obviously the least stable of the larger pelvic viscera are the uterus and the base of the bladder. This follows, not only from the comparative instability of their normal supports, but also from their relation to the vaginal slit in the conjoined tendon of the levators which, by reason of its size and still more because of the injuries incident to difficult childbirth, affords the principal hernial opening.

Etiology.—The causes of uterine and vesical prolapse are to be sought in excessive pressure from above or in defective resistance from below, or both.

Examples of the former are the familiar causes of increased intraabdominal tension, overweight of uterus, and overfilled bladder.

Primary weakness of the pelvic floor is a recognized but infrequent factor. Defect of the floor, whether primary or secondary, may be aggravated by general physical impairment, as in malnutrition and senile atrophy.

The common causes are pregnancy and childbirth, complicated or not by operative violence and faulty involution. Fetzer, in a recent study of the question, concludes that the tendency to prolapse is greater the later in life the first birth occurs. When the first child is born before twenty prolapse seldom follows.

During the later weeks of utero-gestation the structures of the floor are to some extent softened and relaxed in preparation for labor. Webster's and other frozen sections show that the floor is a little lower at the close of labor than before pregnancy. Ordinarily in the absence of parturient injuries it is restored to its normal level in course of postpartum involution. We see cases in which a beginning cystocele wholly disappears after a tardy involution of the pelvic structures has finally become complete.

That there is any material overstretching of the vesico-vaginal fascia during labor is doubtful. Redundance in the fascial covering of a cystocele is the result mainly of a gradual process extending over weeks or months.

Relaxation of the anterior vaginal wall by forward displacement of the cervix is no doubt, to some extent, a primary factor in vesical prolapse.

Perhaps the most frequent lesion of the anterior wall concerned with the etiology of cystocele is loosening or rupture of its attachment at one or both sides of the urethra to the fibrous structures overlying the posterior face of the pubic bones.

The most important obstetric injury leading to vesical or uterine prolapse, as Webster contends, is rupture of the central perineal tendon, the region in which the principal supporting structures of the levator diaphragm meet. To this I would add consequent diastasis of the pelvic recti muscles. The latter is my conception of the essential character of the injury which leads to hernia of the pelvic viscera. As a result of deep perineal laceration, the anterior half of the floor loses an important part of its support, the hernial canal is opened up and its axis brought into near relation with that of the uterus.

Partial backward displacement of the uterus, which may

be primary or secondary to sagging of the vaginal wall, accentuates the vicious mechanism. Except in extreme giving way of the floor the uterus cannot prolapse to any material extent so long as it is in extreme anterior or posterior version.

Relaxation of the utero-sacral, the uteropelvic, and the round ligaments is concerned either as a cause or a consequence of the descensus.

Usually uterine prolapse is a chronic process. It is the remote rather than the direct result of parturition. The same is true of the bladder. Relaxation of its immediate supports is in part primary but usually, for the most part, it is secondary.

Downward displacement of uterus or bladder implies a prolapse of a part of the pelvic floor as well. Hernia of the bladder is not a protrusion of the vesical base through a rent in the vaginal sheath. The vaginal wall goes down with the bladder.

Premature voluntary expulsion efforts, in the first stage of labor, as suggested by Goffe, are extremely rare if my own observations are to be trusted.

Stripping the vaginal wall from the fascia by the driving force of the head, as assumed by Hirst, hardly satisfies the question, since the vaginal wall without the fascia has little to do with the support.

Often the anterior cervical lip fails to recede over the occiput at the beginning of the second stage of labor and it is forced down toward the vaginal orifice as the head descends. Is not this most frequently the mechanism of injuries to the anterior soft parts of the parturient canal and especially of the partial detachment of the lower end of the anterior vaginal wall from its moorings?

Principles that should govern reparative attempts in either uterine or vesical prolapse concern first the levator diaphragm. Of greatest importance are the reapproximation of the levator muscles, to their normal relation with each other, by repair of the central perineal tendon and the correction of the faulty axes of uterus and vagina. The lower end of the anterior vaginal wall also must be restored to its normal anchorage if this has been torn loose.

The fact that visceral prolapse is usually a more or less remote sequel of the traumatism of childbirth emphasizes the necessity for prompt repair of obstetric injuries affecting the anterior or the posterior segments of the pelvic floor, as Hirst has so well pointed out.

Generally the secondary damage which follows in the months succeeding labor is much more difficult of correction than the primary lesions. Often in secondary operations *restitutio ad integrum* is impossible. Frequently we are driven to the substitution of artificial for the normal supports permanently lost by long neglect and sometimes to the sacrifice of the uterus.

To recapitulate, as a rule, the main indications are to correct the relaxation of the anterior vaginal wall, to reestablish its lower attachment, to restore the perineal buttress, and to maintain the uterine and the vaginal axes at an acute angle with each other. Partial or complete obliteration of the hernial canal, as practised in inguinal hernia, has but a limited application.

The pessary, when it can be retained, often is a useful palliative in women unfit for surgical intervention.

Surgical Measures.—Practically all operable cases may be grouped in three principal classes:

1. Uncomplicated uterine or vesical prolapse.
2. Extreme prolapse of uterus and bladder.
3. Cases between these extremes.

1. Simple cystocele may be treated by any procedure which contemplates a firm reattachment of the lower end of the anterior vaginal wall to the fibrous structures at the posterior face of the pubic bones on either side of the urethra, supplemented by a close perineoplasty and a resection, if needed, of the redundant fascia. These principles are embodied in the Hirst operation. Fixation of the lower end of the wall to the fibrous coverings of the pubic bones, I may venture to believe, has more to do with the good results of Hirst's technic than restoration of the muscles of the urogenital trigone.

Satisfactory perineal support is assured only by one of the various procedures which overcome the diastasis of the levators, essentially the pubo-coccygei, good examples of which are Goffe's, Barret's, and the Holden operation.

Beginning descensus of the uterus may be corrected by a close and high colpoperineorrhaphy, together with one of the round ligament operations. In more marked descensus, amputation of the cervix should be added, thus, as Kelly says, depriving the uterus of its leader, which, if not removed, so often worms its way down again through the vaginal canal.

Shortening the utero-sacral ligaments, though sound in theory,

is difficult work and the results are not in all cases wholly satisfactory.

The recently published technic of Dr. G. R. White may serve in moderate visceral prolapse, but the writer has not attempted this procedure. The white line is exposed on either side of the vagina by an incision along its course and the anterior vaginal plate is sutured to them with special care to make the fixation secure near the ischial spines.

An operation formerly practised by Watkins is not wholly unlike that of White. A narrow strip was removed at each lateral margin of the anterior wall; the remaining central portion was drawn upward and backward and sutured at the sulci. As employed at one time in my work, this technic often gave good and permanent support of the bladder base. The anterior suturing, however, interfered materially with the perineal repair.

2. In extensive prolapse of uterus and bladder, hysterectomy, when practicable, offers the best results. The broad ligament stumps are securely sutured to denuded surfaces at the lateral angles at the upper end of the vagina or they are shortened, sutured firmly together, and the bladder and vaginal walls fixed to the transverse beam thus formed. In either procedure, effective suspension of the vagina may be further assured by utilizing the round and the utero-sacral ligaments as well. A thorough perineoplasty also is of course essential. With this technic my results have invariably been good.

3. In my recent work cases intermediate between the foregoing extremes have been treated by the interposition operation. In this procedure the uterus for most of its length becomes a constituent part of the pelvic floor. The cervix is lifted toward the sacral hollow by torsion of the broad ligaments, the slack in the anterior vaginal wall is taken up in part or fully by backward traction, the lower or anterior end of the wall is drawn up by the upward pull of the fundus, and the prolapsed portion of the bladder is displaced upward over the fundus of the uterus. These ends, in my experience, have been fully attained only when the vaginal wall has been sutured to the uterus nearly or quite to the level of the round ligaments.

It is a common mistake in this class of operations to resect too much of the vaginal plate. Resection at the cervical end of the vaginal incision tends to draw the cervix forward. Narrowing at the anterior end of the incision, on the other hand, accentuates the anteversion of the uterus and thus helps to meet the mechani-

cal indications. Occasionally, in moderate cystocele, the bladder displacement is overcome with no resection at all.

With the technic at its best, the immediate mechanical result leaves little to be desired. In a few instances hypertrophy of the anterior cervical lip has developed later. This doubtless might be obviated by primary amputation. Vesical irritability has not in all cases wholly disappeared. Partial recurrence of bladder prolapse, which has occurred in some instances, I have referred to faulty technic or wrong choice of procedure.

I may remark in passing that in this operation the separation of the bladder from the vaginal wall and the uterus is greatly facilitated by the use of scissors in the manner practised by Watkins. The probe-pointed scissors, used by the Mayo brothers in thyroidectomy, best serve the purpose. For gynecologic work they should be curved on the flat.

The mechanics of Goffe's very definite technic amounts in effect to a vesico-vaginal interposition of the uterus. Uterine anteversion, though not to the same extreme degree, is maintained by elevation of the bladder attachment and, when required, by shortening the round ligaments.

Goffe's operation must be credited with the advantage that it brings about a more nearly normal relation of the pelvic viscera and a safer condition of affairs in the event of subsequent pregnancy.

As a rule, at or after the menopause, and in extreme displacement of the pelvic floor, hysterectomy is better than interposition.

With the Alexandroff-Dudley operation, though ideal in principle, and with that of Reynold's I have had no very satisfactory experience; with the Freund-Fritsch technic, with Polk's recent proposal, and with cystohysteropexy, espoused by Dickinson, none at all.

UTERINE AND BLADDER PROLAPSE.*

BY

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WHY uterine and bladder prolapse to the exclusion of rectal prolapse should be specified in the title of the paper for this evening I am unable to state, but of a certainty it is impossible to consider one without the other as they are part and parcel of the same process, viz.. uterine prolapsus.

Complete uterine prolapsus, carrying with it as it does prolapse of the bladder and rectum through the vulvar opening, is in the true sense of the word a Hernia.

In the repair of an inguinal hernia the first step accomplished is the reduction of the prolapsed organs (the intestines and omentum); and in the repair of the particular hernia under consideration the first step again is the reduction of the prolapsed organs (the uterus, bladder, and rectum).

The second step in the repair of an inguinal hernia is to bring about such changes in the overstretched canal as will prevent a subsequent prolapse of the intestines and omentum, and this irrespective of whether the canal is the same anatomically after the operation as it was prior to the prolapse.

The second step in the repair of the hernia under consideration is to bring about such conditions as will hold the replaced organs in the position to which they have been replaced and will tend to prevent the same causes as brought about the original prolapse from again accomplishing the same result, and this irrespective of whether the canal is in the same exact anatomical condition in its relation to the reduced organs as originally obtained or not.

I am well aware that this statement is rank heresy in the eyes of those who have so often explored the exact and minute anatomical relations of the uterus, the bladder, and the rectum, their supports and their ligaments, but who, in spite of their exceedingly interesting and learned expositions, have left us in about the same confused state of mind as formerly obtained as to what is the exact and particular source of support and suspension of these organs.

* Read before the New York Obstetrical Society, March 8, 1910.

The simple truth of the matter is that, these gentlemen to the contrary notwithstanding, there is no one support or character of support to these organs, but the results are obtained by means of multiple supports as well as character of supports. The recent pronouncements that the uterus and bladder are held in place by suspension is true as far as it goes, but when the assumption follows that this is the only support we must expect to find erroneous results in the reasoning which succeeds. Beyond question the uterus finds support from its suspending ligaments, but so does it also find support from resting on firm basic foundations; for instance, in no sense of the word is the strong support of the bases of the broad ligament suspensory. And what would become of the suspensory elements of a normally placed uterus if when it was forced downward and backward it did not meet the firm resistance of the strong and unyielding tissues in the region of the coccyx? The answer is easily found in the result of many cases where the uterus happens to become misplaced backward.

And the bladder is without doubt suspended, but is just as truly supported; and once destroy its support, in many cases, the result is inevitable in spite of its so-called ligaments.

It is simple folly to assume the hypothesis that there is a rupture of the fascia in the anterior vaginal wall and that cases of cystocele are caused by this. As a matter of fact, there is no fascia in the sense in which that term is generally understood, and it is impossible to demonstrate any such condition in a cystocele. The only point of cleavage in the cysto-vaginal septum is directly beneath the bladder mucous membrane itself. It might be said for surgical purposes that the septum between the bladder and the vagina is made up of two parts, the bladder mucous membrane on the one hand and everything else on the other. The vaginal mucous membrane and all the tissues underlying it down to the bladder mucous membrane are so compactly bound together as to make them a single part. To assume, then, as is done, that there is a rupture of a fascia with separation of its edges and a protrusion of the bladder through this opening, forming a true hernia, is to attempt to convince a man who has the use of his eyesight that black is white. To assume, on the other hand, that all cases of cystocele are conditions due to overstretching of the tissues of the anterior wall is to gainsay all experience. Who of us have not time and time again in moderate cases been able to readily demonstrate that the whole condition was due to a

descent of the uterus. When there is added to the descent of the uterus and upper pelvic contents the lack of the basic support of the posterior vaginal wall, the straining due to increased residual and decomposing urine, as well as the forces of intraabdominal pressure, soon stretch the suspensory supports to such an extent as to sufficiently explain the resulting prolapse of the anterior vaginal wall in a large group of cases.

So many and so varied, then, are the supports and in prolapsus so great is the injury to so many tissues that it is no surprise when men seek to found an operation on one or two of them they are led into undefendable and absurd positions.

As a matter of fact, we are forced arbitrarily to consider the repair of these conditions for purposes of discussion into two parts:

I. (a) Those cases in which there is a moderate cystocele with descent of the upper pelvic organs.

(b) Those cases in which there is a greater or less stretching of the anterior wall together with the descent of the upper pelvic organs.

II. Those cases in which there is a complete prolapsus of all the organs of the pelvis.

In the first instance (I, *a* and *b*) the cure is so simple and easy that it is a matter of astonishment to observe the lack of success of operation with old and tried methods, and the extensive and dangerous dissections being adopted for their repair.

For a cystocele due to overstretching and descent of the upper pelvic contents, a rapid and absolutely sure cure is reached by the old Sims' oval denudation with a few modifications. The anterior vaginal wall being caught by a pair of double tenacula at or near the cervix uteri as circumstances indicate is brought out of the vulva and put on a stretch posteriorly toward the rectum. This exposes the entire length of the anterior wall (outside of the vulva), the edges of the introitus hugging the protruding mass completely around its circumference. The labia are held widely apart by the fingers of the assistant on either side, thus securing an uninterrupted view of the field of denudation.

A denudation is made of the entire protruding mass as it appears before the operator. This is carried laterally on each side to the point where the protruding mass is grasped by the lateral walls of the introitus. Anteriorly, it is carried sufficiently near the urinary meatus to wipe out any urethracele which may

exist; posteriorly, it is carried as near the cervix uteri as the relaxation indicates. The width of the oval denudation, anteriorly, is as wide as is necessary to take in any existing urethracele; posteriorly, if deemed advisable, it may be sufficiently wide to draw toward the center line the basis of the broad ligaments from either side. It will be seen that this operation is merely the Sims' oval modified by denuding the entire space inside the oval and in addition by carrying it further forward and making it wider at the ends, according to the circumstances to be met. One further and important modification is involved, viz., the depth of the denudation. Care is taken to cut deep and quite often the bladder mucous membrane is exposed.

The entire wound is closed in two layers by a single continuous catgut suture. The suture begins at the urethral end of the denudation in and upon the denuded surface (taking in about one-half or more of the denudation in width) and is carried backward toward the cervical end. The suture then begins to take in the mucous membrane edges on its return trip, thus burying the first row and closing the entire wound its full length. While bringing the mucous membrane edges together it is plainly indicated whether or not the denudation is sufficiently wide and if not a few further strips removed from the sides make it complete and perfect.

It will be noted in passing: The first part of the suture (the buried portion) secures a good thick wall for the bladder to rest upon; this is especially advantageous in the cases of a thin attenuated wall; the buried portions of the suture takes a large part of the tension off the surface portion which unites the edges of the mucous membrane and gives a still firmer support upon which the bladder may rest.

The support is the firmer and less likely to yield than any of the so-called flap-splitting operations (Saenger, Goffe, Stone, Reynolds, *et al*) in that in these procedures the edges of a sharply defined comparatively thin tissue is brought together edge to edge as was formerly done in ventral and other hernias, while here the principle of overlapping and a wide surface of union is adopted as is now accepted so universally in all hernia operations. And this in spite of the fact that I fail to recognize a distinct and well defined fascia as taught by others. Finally, the full length of the original anterior wall is preserved.

If necessary the uterus is given additional support by widening the oval at the cervix to any extent required and drawing the

bases of the broad ligament forward toward the center line. (Emmet, Reynolds, *et al*).

The objection offered in general by Goffe, Stone, and others, that the bladder mucous membrane is thrown into folds and retains more residual urine, is purely theoretical and fanciful, and only tends to cloud the subject. The bladder mucous membrane is so loosely connected with the vaginal wall that as the wall is lifted up and held in place by the operation (the excess of the wall being resected by the denudation) the excess of bladder which took part in the cystocele simple spreads out laterally to its original and normal position, and is not thrown into folds and ridges. The use of the cystoscope will readily demonstrate this fact to any doubters.

The proposition to detach the bladder wall from the uterine cervix and to spread it out and stitch it higher up on the uterine fundus so as to overcome these supposed ridges is therefore unnecessary; to carry out the same procedure in order to restore the ligamentous supports is fallacious and superfluous and unnecessary and mischievous and dangerous.

Fallacious, because it would in no way restore the ligaments; what it would do would be to at *one* point substitute a broad surface of adhesion to replace the ligaments of that particular part.

Superfluous, because the ligaments at the particular point under discussion have the least bearing on the support of the bladder, and in addition can be more rationally restored by another method in cases in which this is necessary at all, viz., complete or nearly complete prolapsus.

Unnecessary, because the excess of overstretched suspension ligaments should be resected by the denudation, and if these ligaments really existed as ligaments (which they do not) they could be reduced to exactly the proper length to support the replaced prolapsed anterior wall and bladder. And this is exactly what occurs in a properly performed operation of this type. It is purely a question of a proper width and depth of the oval denudation.

Mischievous, because in cystoceles due in whole or in part to descent of the upper pelvic organs it accentuates and renders permanent the descensus. The fact that it throws a posteriorly displaced uterus forward in no way affects the general descensus of all the pelvic organs, and surgeons are continually performing operations for just such conditions of descent and anterior

displacements. To complete or nearly complete prolapsus such a procedure would be absolutely useless and would subsequently defeat or badly complicate the necessary intraabdominal procedures.

Dangerous, because of the chances of the results of sepsis should that accident occur in such deep and extensive wounds; and, further, of the danger of injury to the ureters.

Taking it all in all this extension of the operation is absolutely unjustifiable in such a simple lesion and such an easily cured one as a cystocele of the first class mentioned. In the second class it is absolutely contraindicated for reasons given above.

The oval denudations of Sims' modified as to the points given accomplishes all and much more than any of the flap-splitting operations proposed; it recognizes all the principles involved in these operations, is easily and quickly performed by any surgeon, and is sure in its result. I have been performing this operation on cystocele since 1888, four years before Saenger's original paper on his so-called flap-splitting, and have been teaching it ever since I can remember. Through all these years I have been unable to find a single fault with it or with its results.

In spite of what is said about "*nature's plan*" of suspension, if we do not supplement the work on the anterior wall with equally good work on the posterior wall, so as to restore this basic support by securing good and firm apposition of the two walls, any and every operation on the cystocele will in a large number of cases fail. The fact that this is true is sufficient to dispose of "*nature's plan*" (suspension) as an exclusive one.

This paper has already extended to the limits of our time and I will briefly outline the balance of the procedures I am in the habit of utilizing in prolapsus uteri.

A curettage of the uterus, if necessary; an amputation of the cervix uteri (this depending largely on the size, but especially on the ulceration of that organ); the cystocele operation herein described, and an Emmet operation on the perineum completes the plastic work. The Emmet operation is so eminently satisfactory for the perineum that I continue to perform it in practically all cases. As I have written on this operation elsewhere and often it will be unnecessary for me to more than mention it in passing. The failure to obtain success from its use has been, in my judgment, due to a lack of knowledge how properly to perform it.

With the plastic work I am able to cure all cases of rectocele and cystocele involved in the first class. Cases of marked descent of the uterus (especially where there is reteodeviation and prolapse of the ovaries) require, in my hands, an abdominal section. If the patient is of the child-bearing period I then perform my own operation for retrodisplacement which thoroughly corrects a moderate degree of descensus; if the patient be beyond child-bearing for any reason I fix the fundus uteri firmly and permanently to the anterior abdominal wall by two silkworm-gut sutures, these sutures passing deeply into the fundus uteri and coming out on the fascia of the abdominal wall where they are secured and buried.

Very often such cases come to me with a greater degree of relaxation and stretching of the pelvic tissues, such a relaxation as will not be taken up by the above procedure.

Some years ago I operated upon such cases by vaginal hysterectomy and devised a method new at the time but since claimed by others. After performing the hysterectomy the stumps of the broad ligaments were drawn down into the vagina and the vaginal vault was pushed as high up as possible by an assistant as the stumps and vagina were stitched together. This proved more or less satisfactory. Apparently less so, as I soon devised an intraabdominal method of dealing with the same condition, and, strange to say, that has also been appropriated by others, to wit: After performing a hysterectomy by amputation at the internal os, being careful to make the amputation square across instead of cup-shaped, the stumps of the ovarian arteries were both brought in contact with the amputated stump of the cervix and securely fastened at that point. Properly performed this procedure gives good support to the pelvic vault, but where great relaxation obtains it is very often not sufficient so I turned my attention to a third procedure at about the same time as did Polk (I think), and, strange to say, for a third time have I found others to appropriate this procedure as their own. Were I not an extremely modest man I should be tempted to write a paper devoted to "Work I have developed or helped develop, and which has been ignorantly or maliciously stolen by others," in which event I should include several more procedures of more or less importance. This final step in the development of my present work in prolapsus consists of the hysterectomy at the internal os as above performed, and the permanent fixation of this stump to the abdominal wall by means of two silkworm-gut

sutures carried through the whole thickness of the cervical stump and buried on the fascia of the abdominal wall.

In two or three such cases, after performing one of the above operations, I have subsequently had the patient return to me with the thin abdominal wall sunken in and the prolapsus reproduced in part. A number of times, therefore, I have performed the following operation with the result of a satisfactory cure. A complete and total hysterectomy, a sufficient amputation of the vaginal vault, a closure of the vaginal mucous membrane, and a fixation of the vaginal vault to the abdominal wall as close to the pubic bone as possible. This procedure I have not seen claimed as yet by any one else, but there is time.

It must be evident to any man of experience in these conditions that no one procedure, nor series of procedures, will answer in all cases. The injuries are multiple and the relaxations and stretching of tissues varied, and the successful operator will be he who is able to having first appreciated all the underlying causes and difficulties will not try to return the parts to their original minute anatomical positions, but will do away with hair splitting and adapt himself to the conditions as they face him in each case and will work for a *result* no matter what the technical criticism of the steps may be.

Nature is a great adaptor, and if you will get the organs in their relatively proper positions and hold them there it matters little whether there are a few folds more or less in the bladder, whether the bladder is a bit encroached upon, whether certain ligaments are put out of business, whether there be a true fascia in the vaginal vault or not. Nature will soon get used to the changed condition, and all rough edges which have not been too nicely trimmed up (with consequent, unnecessary prolongation of operation) all irritability of the bladder, all faulty ligaments will be found subsequently to be a thing of the past, and the patient enjoying good health and comfort.

GENITAL PROLAPSE: ITS OPERATIVE CORRECTION
BASED ON A NEW STUDY OF CLEAVAGE LINES
AND SLIDING SEGMENTS.*

BY

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(With fifteen illustrations.)

RECURRENCE OF CYSTOCELE AFTER OPERATION.

I class as recurrent any noticeable droop of bladder-wall, even though a small cy-tocele with few symptoms was found as the only defect left after an extensive operation for complete extrusion of the bladder. Among those who returned at a late date for examination there was found one recurrence in every ten cases. It seemed fair to presume that this may have also been the proportion among those who did not return. Therefore I guess at the frequency of this partial recurrence as one in every five operations. In a particular group specified later the proportion was larger. Such results, if general, call for an overhauling of our methods of operation.

In reviewing cases recurrent after my own operating, I found ten so fully noted and measured, and traced by lead tape or solder wire before and after operation, as to be especially adapted for study, and concerning these I reach the following conclusions:

The choice of operation had little to do with the recurrence. It followed anterior colporrhaphy with perineorrhaphy, three cases; fixation of stripped and lifted bladder to uterus, which was then fixed or suspended, two cases; interposition of Watkins, one case; vaginal hysterectomy with fixation to broad and round ligaments (Goffe) one case; and ventral fixation of bladder to abdominal wall, three cases; in every case operations on the pelvic floor and anterior vaginal wall having been fully carried out.

Age had little bearing on recurrence. The ages were twenty-nine, thirty-six, thirty-seven, forty, forty-three, forty-five, forty-seven, forty-eight, sixty-four, seventy.

*Read in abstract before the joint meeting of the New York and Philadelphia Obstetrical Societies, March 8, 1910.

Among overlapping causes which would help to extenuate relapses, there were noted, activity too soon, three cases; age forty-seven or over, four cases; fat abdomen, four cases; muscular flabbiness, four cases; tight clothing, six cases. One instance was due to severe and prolonged coughing. The only conditions that could be called general were 1. *long duration*, time between injury and operation averaging ten years; 2. *local tissue defect*, chiefly atrophy and flabbiness, and 3. *strain*, patients being housewives, domestics, stage dancer, society dame. Back of all these causes lies our lack of anatomical knowledge, and its consequence, somewhat haphazard operative correction.

If such results are general, then we must urge early routine examination of the pelvic floor before hopeless tissue changes occur, say two years after every labor, with care to emphasize a defect, if present, by asking the patient to strain down hard, or let her stand, with corsets tight, while one examines. After operation we must undertake long watchfulness in such matters as dress and strain. Lastly, the surgeon should be guarded in his promises, saying that, for perfect results, in bad cases, a second but smaller operation *may* be needed, and in women whose general condition is one of utterly relaxed tissues success or relief should not be promised unconditionally.

Of symptoms not relieved I place first the bearing-down discomforts. When partial recurrence occurs this symptom remains. The failure to relieve irritability of the bladder I think largely due to omission to treat the trigonitis left over, and this item must constitute part of the after-care of every cystocele patient. Varicosity of bladder-base as a cause of continued irritability remained in those whose droop returned. Incontinence is a matter calling for separate study, and can hardly be taken up here.

As to the reasons for defective diagnosis or incomplete operation, certain new anatomical considerations are here urged, based upon a hundred private operative cases in which full notes were recorded, and upon the available frozen sections.

CLEAVAGE LINES AND SLID SEGMENTS.

Even after long study the downward displacements of the pelvic organs have seemed protean, baffling, confusing. There has been proposed no grouping which is anatomically simple and clinically useful. Such an understanding and classification was impossible until the publication of a large number of sec-

tions of prolapses, each accompanied by a detailed description. In the thirty-three cases of the remarkable series of the Halban-Tandler book (*Genital Prolaps beim Weibe*, Braumüller, Wien, 1907) this material is at hand, and I am able to offer a solution of the anatomical muddle, built on clearer ideas, which, altering our point of view in operating, gives us cause to hope for better results.

The Viennese authors classify their cases under two causes—downward thrust in the anterior peritoneal pouch (Fig. 2), the vesicouterine, or in the posterior pouch, the uterovaginal (Fig. 14). Then they form for cases of “descensus uteri” and “rektokele”—two separate and unrelated groups. This explanation offers no practical help to the man at the operating table.

The grouping now first proposed fits almost every section in the book, as well as my own lead tape and solder wire tracings. The proposition is as follows: *There are in the pelvic diaphragm four lines of cleavage* (Fig. 1). They are not the well-known “faults in the strata” of Hart and Barbour—urethral canal, vaginal canal, rectoanal canal. In labor it is unquestionable that the vaginal slit is the cleavage plane whereby the pelvic floor divides into an anterior pubic segment that is pulled upward and a posterior sacral segment that is thrust downward. But in the landslides caused by labor and the slow landslips that happen later, segments come into action that are not the “pubic” and “sacral,” and these two terms, which have to do with the physiology of labor, become a hindrance when considering the pathology of labor and the mechanics of prolapse.

The *four cleavage planes* of pelvic floor prolapses run as follows:

1. Postpubic, close to the bone.
2. In the urethro-vaginal septum, close behind the urethra.
3. In the rectovaginal septum, just behind the vagina.
4. Along the ano-rectal canal.

Consequently there are *four prolapse segments* in the pelvic floor:

- a. The urethral segment.
- b. The vaginal segment (including trigone and cervix).
- c. The perineal segment.
- d. The retroanal segment.

The diagram (Fig. 1) is easier to understand than the following specifications:

The urethral segment includes the whole urethra, the anterior (postpubic) bladder-wall and the postpubic triangle, and is held in place by the triangular ligament and pubovesical ligament.

The vaginal segment includes the vagina and most of the urethrovaginal septum and the bladder-base, the cervix and the posterior vaginal wall, and is attached laterally to the base of the broad ligaments, behind to the uterosacral ligaments, and has no levator fibers upholding it by running into it.

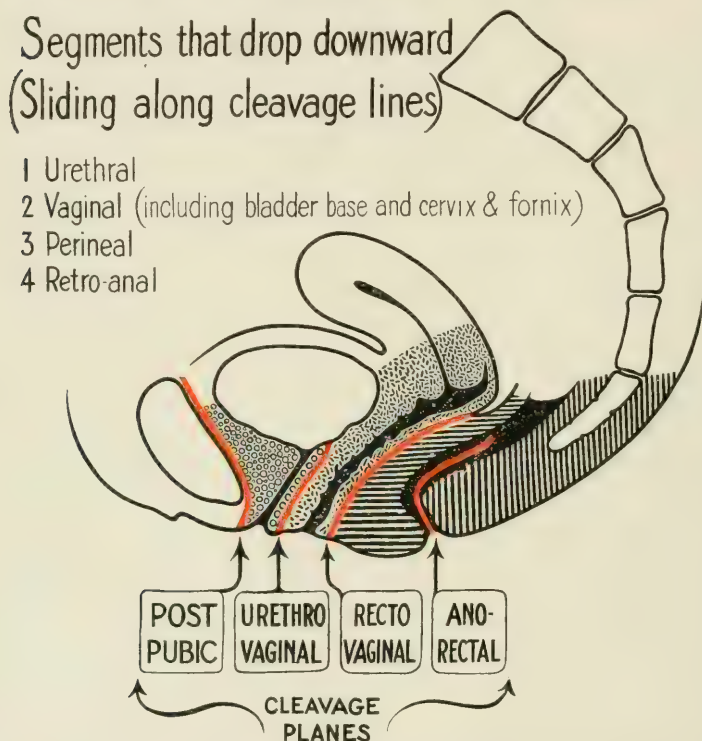


FIG. 1.—The lines of cleavage in the pelvic diaphragm that group prolapse cases anatomically and clinically, and determine choice of operation. The vaginal segment slides most frequently, and very commonly leaves the perineal and retro-anal segments in place.

The perineal segment includes all the perineal pyramid and recto-vaginal septum except the posterior vaginal wall, and does get levator fibers.

The retroanal segment includes the Hinterdamm and the coccyx and is upheld by the levator and pubococcygeus (Fig. 7).

Laterally, the cleavage lines are fully as important, but well recognized. The steep slopes of the levator fascia and the strong crosswise span of the triangular ligament must be searched for on the operating-table, and lateral support obtained, or our work fails.

This clinical explanation saves us a lot of remembering of concepts of fascial layers and minutiae of attachments most confusing to keep clearly in mind and most of them unfindable in operations. However learnedly we may talk of dissecting-room details, in the operating-room we work in masses and layers,

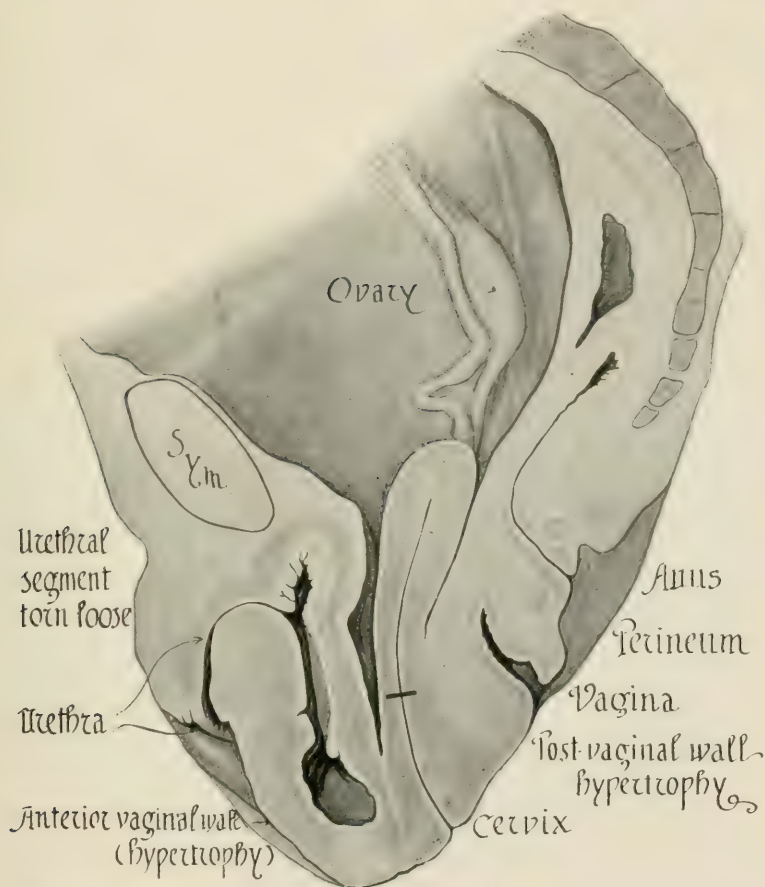


FIG. 2.—The urethral segment badly dislocated. The internal orifice and the anterior bladder-wall are far from their retropubic base, and need reanchoring there. (Halban & Tandler.)

and not in muscle-fiber films nor in paper-thin edges, and all these procidentias exhibit atrophies of extreme degree.

At the risk of prolixity, for the sake of completeness, we may go into the diagnosis of a landslip of each of these segments, their degrees, their relations to the other three segments, and the treatment of the prolapse of each.

1. If the urethral segment slides (Fig. 2), the diagnosis of the urethrocele is made with the glass catheter by studying the relation the canal (and the anterior wall of the partly filled bladder) pressed down by straining bears to the rear of the pubic bone and subpubic ligament. The location of the inner opening of the

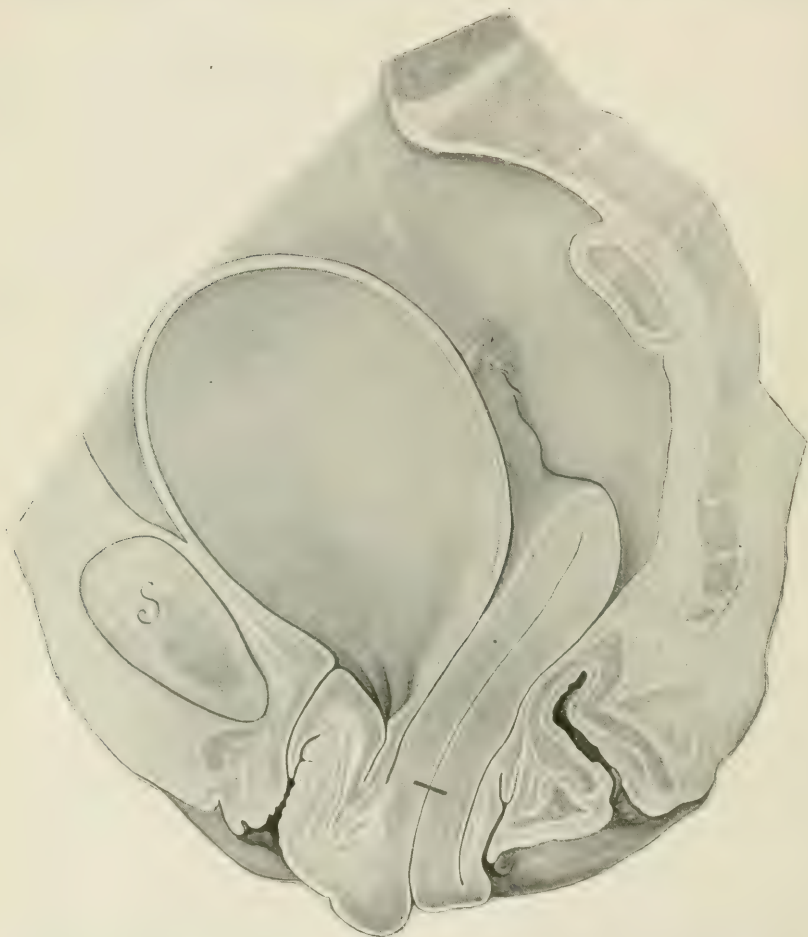


FIG. 3.—The vaginal segment slides (vagina-bladder-base-cervix) leaving the other three in place. Plastics and a round ligament operation or ventral fixation would suffice, and the long, edematous corpus would shrink after operation. (H. and T.)

urethra is, practically, the whole thing. The urethral segment is frequently left standing in place in bad cases of prolapse (Fig. 15). A concavity downward in the course of the urethra may be of itself of little more moment than the condition it resembles—large anterior columns of the vagina. The whole urethral segment never slides far without that slip of the vaginal

segment which drags down the bladder-base. Restoration of the perineal segment rarely holds up a badly depressed urethral segment. In the worst cases of injury the urethral canal runs toward the coccyx, or, concavity upward, points downward toward the thigh (Fig. 12). In such cases, particularly when the whole canal is displaced bodily downward (Figs. 2, 11, 12),



FIG. 4.—Intravaginal cystocele, with the first degree of outward slip of the vaginal walls, the cervix following. The anterior bladder-wall and urethra are in place and the two rear segments and levator intact. (H. and T.)

the anterior (post-pubic) bladder-wall must be sutured to the lower abdominal wall. One of the common causes of failure, heretofore, in completely curing bladder prolapse, has been ignorance concerning this segment, its independence, and the place where it needs to be made fast. My own experience in anchoring it has been limited to a few cases. In the 33 Vienna sections the urethral segment is found to be markedly displaced in fifteen

cases; it goes with the neighboring segments, the vaginal, in these fifteen cases.

2. The vaginal segment slides more often than any other in the procidentias of considerable bulk, as it is made up of the bladder-base and cervix, as well as the greater part of the urethro-vaginal septum (Fig. 3). The bladder goes with the uterus, but may leave the anterior vesical wall and urethra in place. It should

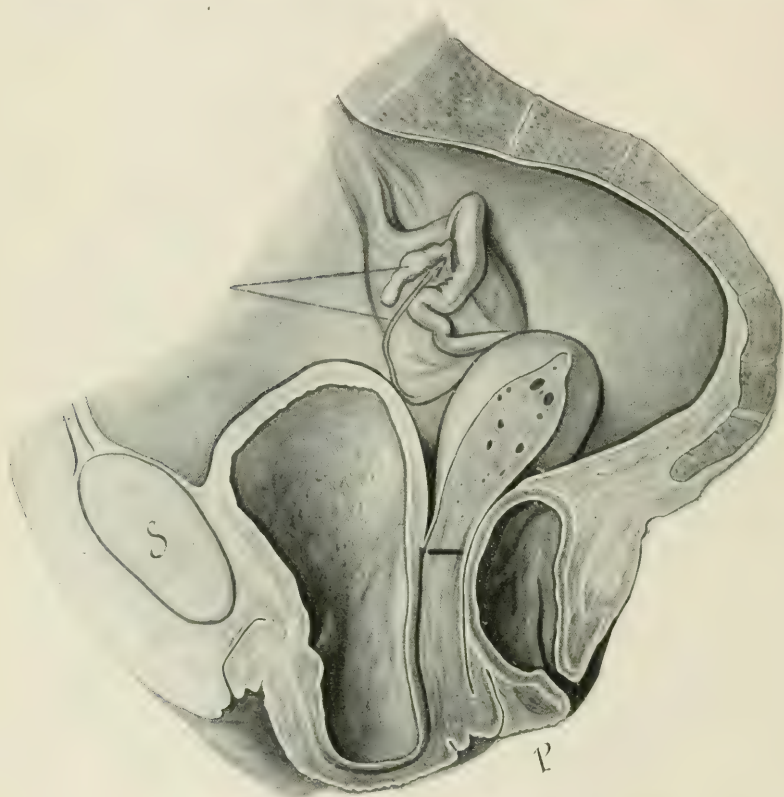


FIG. 5.—The perineal segment has dropped with the vaginal owing to injury to the anterior part of the levator and its fascia and to the attachment of the anal sphincter. (H. and T.)

be noted that in genital prolapse nearly all the stress has been laid upon the womb hernia. As a matter of fact the bladder hernia is, of the two, the more important clinically, and surgically by far the most difficult to hold up.

The degrees of prolapse of the vaginal segment are conveniently named:

a. Intravaginal cystocele, not protruding beyond the hymen under strain, with or without descent of cervix, which may be

either hypertrophied, anteflexed, or part of a retroversion. (See Fig. 4.)

b. Extravaginal cystocele, protruding beyond the hymen on straining, with or without protrusion of the cervix. (See Fig. 5.)

c. Complete extrusion of bladder and uterus, one or both, beyond the plane of the outlet of the pelvis. (Fig. 2.)

3. The perineal segment is displaced more often than any other

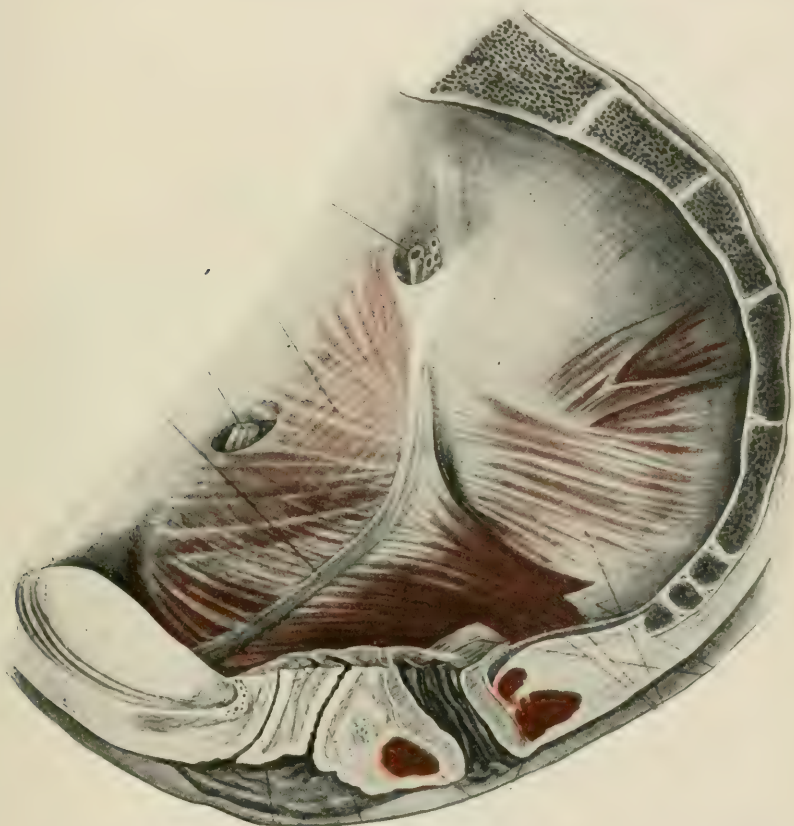


FIG. 6.—Section of normal pelvic floor with good fascia and well-developed levator and transverse supports. (H. and T.)

among dislocations of the lesser degrees, because the commonest injuries the pelvic floor suffers are those inflicted by the two battering rams, the fetal column and the fecal column. The larger body tears structures and weakens the anterior rectal wall; the smaller wears it out by worrying at it.

One variety of rectocele is not easy to correct and prone to recur, and that is the forward protrusion originating high on

the rectovaginal septum. This I have considered in a separate paper. (High Rectocele after Perineal Repair, AMER. JOUR. OBST., vol. lvii, No. 3, 1908.)

4. The retroanal segment is not often the subject of prolapse in a marked degree (Figs. 12 and 14), and this is fortunate, as the extreme down-dropping of this segment is very difficult of relief

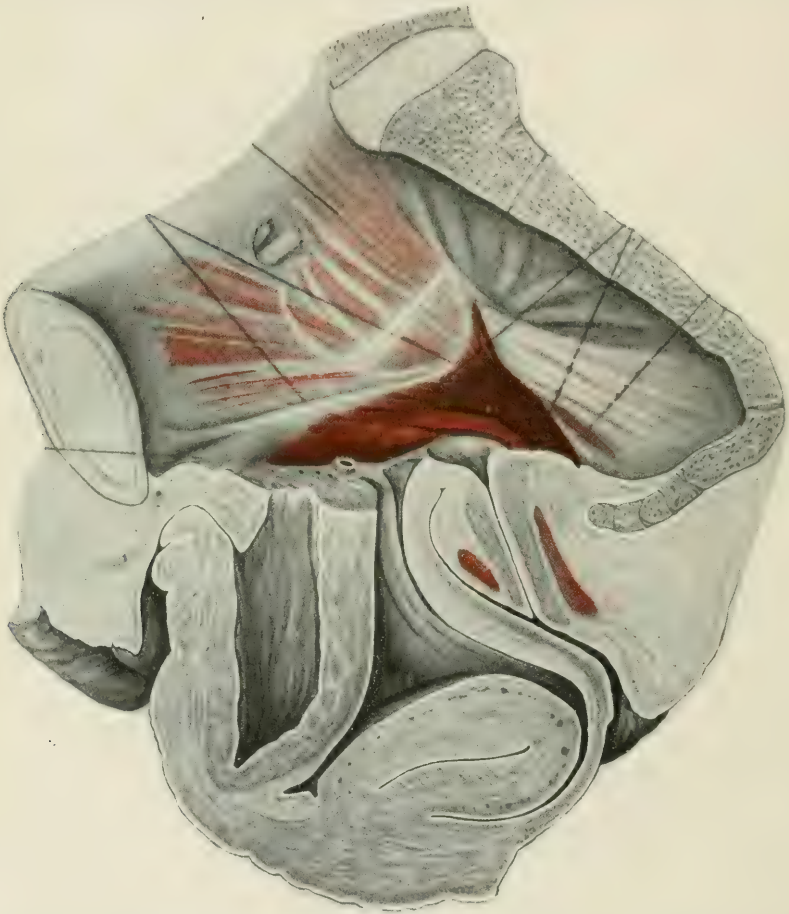


FIG. 7.—Prolapse of the uterus and bladder in the presence of a levator notably strong and one which holds the sacral and perineal segments aggressively. (H. and T.)

if it means a hopeless atrophy of levator and fascia. In the worst atrophies the pelvic floor may have to be built out of buttock flaps slid inward.

The radical novelty of the disconcerting dissections in the Talban-Handel book is absence of sag of the Hinterdamm in the

presence of complete extrusion of bladder and uterus (Figs. 7, 8, 9). Bracketed with such procidentia one finds in these plates and notes many levators well developed and some strong and thick and active (Figs. 7, 8, 9). Our faith in the trusted muscle and its fascia seems blasted. But if the function of the levator is

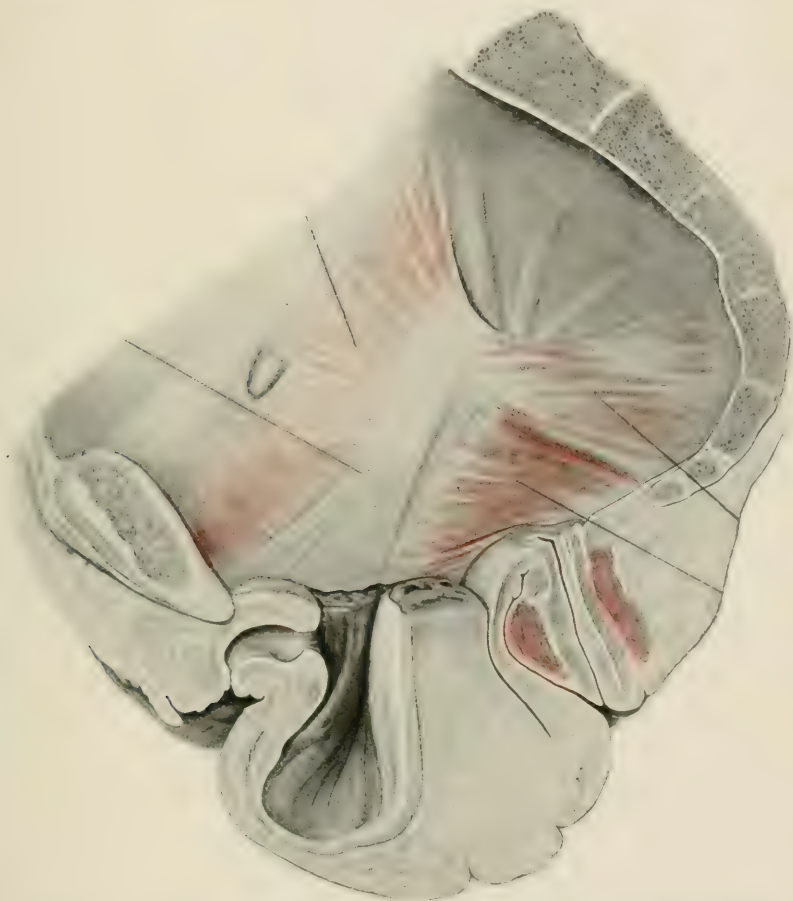
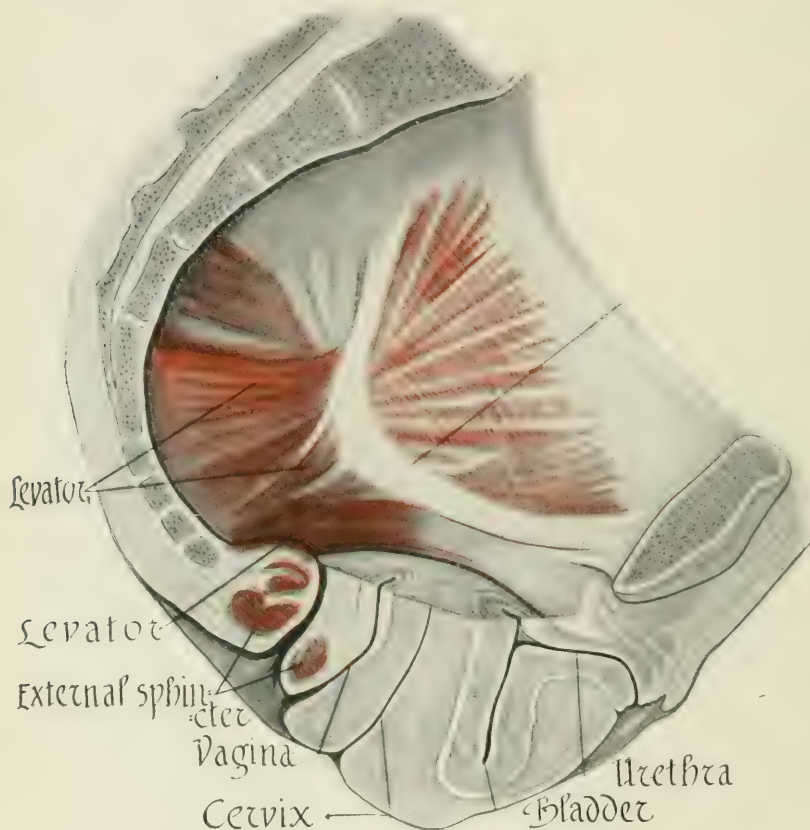


FIG. 8.—Incomplete prolapse with good levator and well lifted "sacral segment of Hart." The urethral segment is away from its anchorage. (H. and T.)

entirely to uphold the retroanal segment and partly to sustain the perineal segment, and if it is responsible for these duties alone, the bottom does not drop out from our faith, or the patients', without reason. We see that even in the presence of a levator spasm and hypertrophy sufficient to drag anus close to pubic arch after bad perineal damage such tension cannot hold back

the insinuating water wedge or the interpolating cervix when the anterior anchorages are actually torn away.

Any combination of the four segments may drop downward (Figs. 10-13). A few of the worst cases involve all. It is to be



Prolapse of uterus and bladder though levator is strong and sound. Perineal & sacral segments in place.

FIG. 9.—A large prolapse with a levator shown by dissection and action to be well developed. (H. and T.)

noted, however, that the second, or vaginovesicouterine, is the one commonly involved, and with it, not infrequently, the urethral.

To the typical dislocation downward of any segment there is added, in certain cases, a deformity due to edema and hyper-

trophy, as of the anterior vaginal wall or cervix (Figs. 7-9). I formerly supposed that the bladder slid off the cervix, but I can find few instances of this. That the vesicouterine pouch may

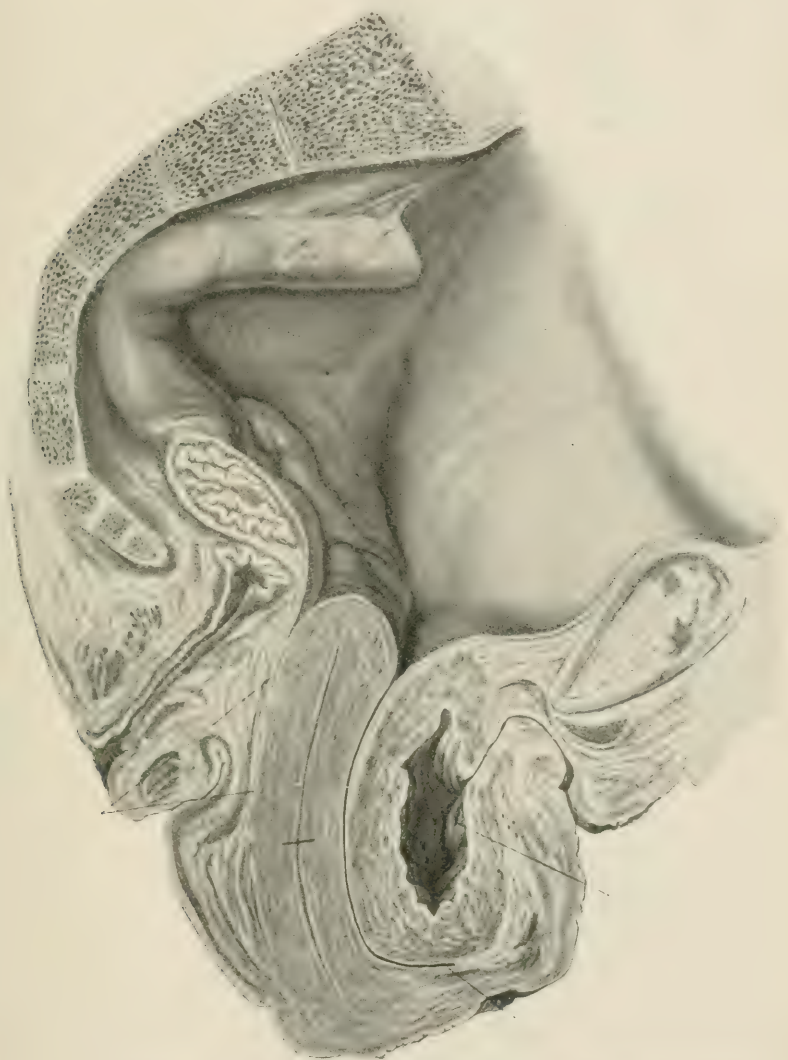


FIG. 10.—Prolapse of all four segments with evident need of ventral fixation of the bladder. (H. and T.)

become the hernial sac of an enterocele boring its way out beyond the vulva has been noted (Fig. 2). It is much rarer than the hernia of the uterorectal pouch (of Douglas) which occurs at times when the sacral segment sags (Fig 14).

SURGERY OF THE SEGMENTS.

Surgical correction of the lesser and greater degrees of the chief hernia (the vaginovesicouterine) is less satisfactory than



FIG. 11—Prolapse of all four segments. (H. and T.)

restoration of the other segments, chiefly because the bladder-base cannot be conveniently or surely fastened back into place by

hitching it to any supports it was intended to hang on. We can raise and swing the uterus by its guy ropes, or anchor it, or lay it to span the gap from urethral to retroanal segment, or remove it. To deal with it is not difficult, for it is a solid

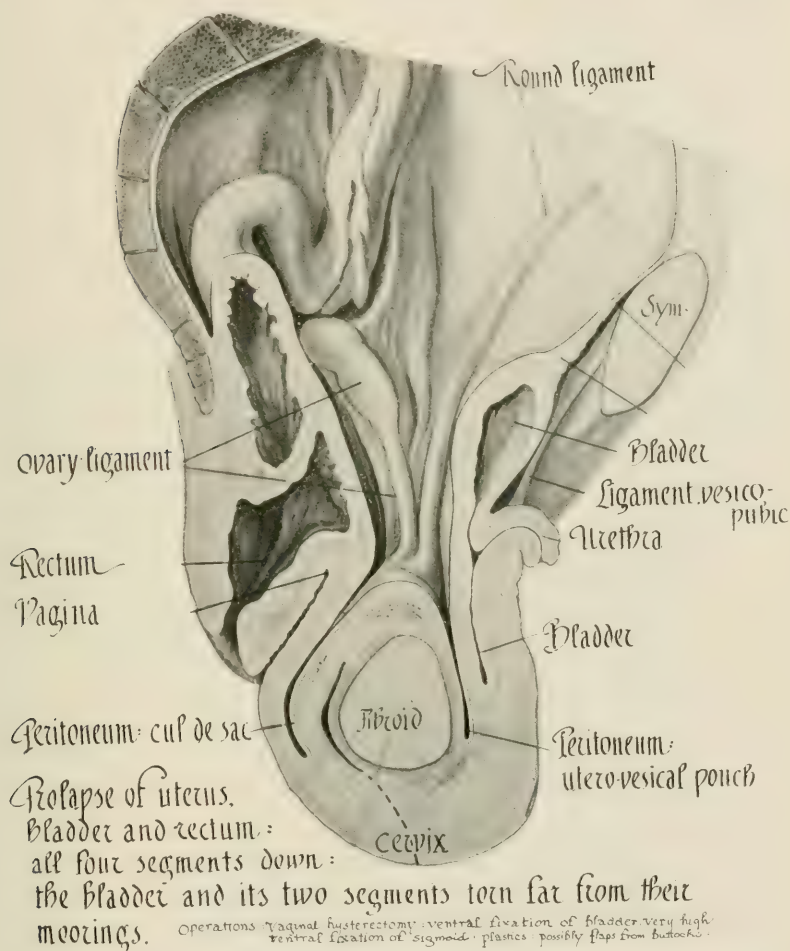


FIG. 12.—All four segments very low, the bladder dragged far from its moorings and demanding ventral fixation after the vaginal hysterectomy. The retroanal segment requires a sigmoid or rectal fixation. (H. and T.)

organ, and, moreover, often out of commission. But the shifting water-bag is elastic, hung over an opening, jounced when full, and often over-full, and is pressed down by whalebone springs. To rebuild lateral sloping shelves that will hold this bag is the baffling problem in pelvic plastics and only next in difficulty to

the repair of an ancient sphincter damage. To meet it a surgeon must have all expedients ready in order to select that which will suit each particular set of conditions.

1. In old women with bad bronchi, or hard arteries, a flat



FIG. 13.—The atrophied, stretched levator of Fig. 12, and the long pubovesical ligament. (H. and T.)

pessary like the Schatz may span the levator gap if the levator has some hold on the retroanal segment. The Byrne pessary is also of use.

2. Anterior colporrhaphy suffices for uncomplicated intra-vaginal cystocele in young women and with recent injuries, if it is

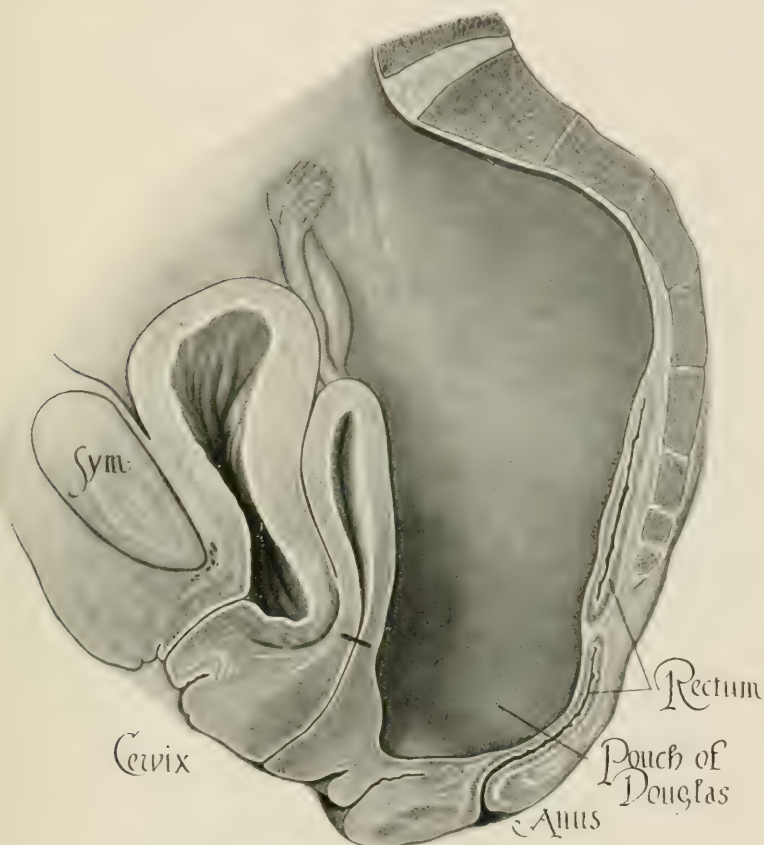


FIG. 14.—Example of the variety in prolapse. The anterior segment is exactly in place while the three rear segments sag. Ventral fixation of the uterus if the patient is old, or work to restore fascia and levator with fixation of sigmoid would relieve this condition. (H. and T.)

backed by a good perineal repair, but in the presence of pronounced atrophy or flabby make-up, the bladder would better be freed and slid up the uterus.

3. Fixation of bladder to uterus (vaginal fixation of uterus) fits a number of the intravaginal and extravulvar cystoceles, the bladder being slid up the uterus, but not fastened to the fundus unless the Fallopian tubes are tied off.

4. Interposition of the anteverted uterus between the bladder and the anterior vaginal wall (Watkins) has a field in old women or women who should be sterilized, possessed of small uteri, and exhibiting good urethral and sacral segments. The relapses have been due to neglect of the last specification.



FIG. 15.—All the segments drop low except the urethral, yet the pelvic floor has no evidence of injury in the median line. This is a case of marked relaxation of the levator with opening up of its fibers. (H. and T.)

5. Fixation of bladder to uterus, with ventral suspension or fixation of uterus. A bladder-base, if much elongated, is to be slid up on to the anterior uterine wall.

6. Ventral fixation of bladder (naked wall to naked rectus)

is necessitated where the urethral segment is torn loose and much depressed (Figs. 1, 7, 8, 9, 10, 11, 12); where the bladder is of great volume and extruded (Figs. 2, 3, 4, 10, 11); where no adequate pelvic floor can be built, and whenever ventral fixation of the uterus is called for. (Ventral Suspension and Ventral Fixation for Prolapse of the Bladder with the Uterus, *Brooklyn Medical Jour.*, June, 1903.)

7. Vaginal hysterectomy, with fixation of bladder to broad and round ligaments (Goffe). This will fail if the urethral segment has dropped far.

8. Fixation of sigmoid—in the deepest sacral segment prolapse with large culdesac hernia, it is required. (Figs. 11, 12, 14, 15.)

It is of the greatest importance in all these cases that the urethral segment, if protruded, be lifted and made fast, and neglect of this measure spells relapse. With all the foregoing, except perhaps the pessary, it goes without saying that the best possible perineal support must be built, even if, in the absence of pelvic floor structure, flaps have to be swung in from the buttocks, as I have done four times.

Summary.—From the point of view either of pathological anatomy or surgery the frozen sections show the importance of recognizing certain cleavage planes in the pelvic diaphragm, and intervening segments that slide. The cleavage runs 1. postpubic, close to the bones; 2. in the urethrovaginal septum; 3. in the rectovaginal septum, and 4. along the anorectal canal. If the urethral segment falls any considerable distance, only ventral fixation at the rear or top of the pubes will hold the upper urethra and anterior bladder-wall. The second segment (vagina, bladder-base, cervix) is the common hernial mass. A convenient nomenclature would be intravaginal cystocele; extravaginal cystocele, protruding beyond the hymen on straining, and complete extrusion, bladder, cervix, uterus, one or all. For the worst cases, the writer employs ventral fixation of the bladder, whether vaginal hysterectomy is done or not. The retroanal segment, when very badly prolapsed, particularly in the presence of protrusion of the uterorectal pouch, may call for sigmoid fixation, and the wide-open bony outlet of the pelvis may present no tissues out of which a diaphragm can be built so that flaps from the buttocks may be required.

INTRAMURAL SEQUESTRATION AND FIXATION OF
THE CORPUS AND FUNDUS UTERI FOR THE CURE
OF PROCIDENTIA UTERI EXISTING IN WOMEN
WITH WHOM FURTHER PREGNANCY IS
NOT POSSIBLE.

BY
PHILANDER A. HARRIS, M. D.,
Patterson, N. J.

(With two illustrations.)

I HAVE subjected six women to a possibly novel procedure for the cure of procidentia uteri, and since these operations have been followed by most gratifying results I wish to describe the operation for whatever interest or value it may possess for others.

DESCRIPTION OF THE OPERATION.

Cut a median line abdominal incision from 1 inch beneath the umbilicus downward for 3 or 4 inches, and deliver there through the corpus and fundus uteri.

While an assistant grasps and draws the uterus well out of the incision, the cut edges of the parietal peritoneum are sewn to and around the uterus at the junction of the cervix with its corpus. This sewing crosses the broad ligament at either side about 2 inches away from the fundus. After thus attaching the opposing cut edges of the peritoneum to the uterus and the broad ligaments, the suturing is carried upward to the top of the incision, thus closing the peritoneal cavity with the corpus and fundus still held in the grasp of the assistant and, of course, outside of the peritoneal cavity.

While the assistant continues to hold the uterus outside of the incision, an iodoformed 5/16-inch gauze and rubber tissue drain is placed on top of the muscle and beneath the fascia to a point 2 or 3 inches to one side of the incision, at which point it is made to emerge from a small stab wound. The tapering tail of this drain is placed in the wound between the peritoneum and fascia. The anterior surface of the corpus and fundus uteri are next denuded with a knife, after which the fundus is

* Read before the American Gynecological Society, Washington, D. C., 1910.

seized with a hook or volsella with which it is dragged upward as far as easily possible toward the umbilicus and made to nestle in the incision anterior to the peritoneum and between the recti muscles. The fascia is next sewed from the umbilicus down-

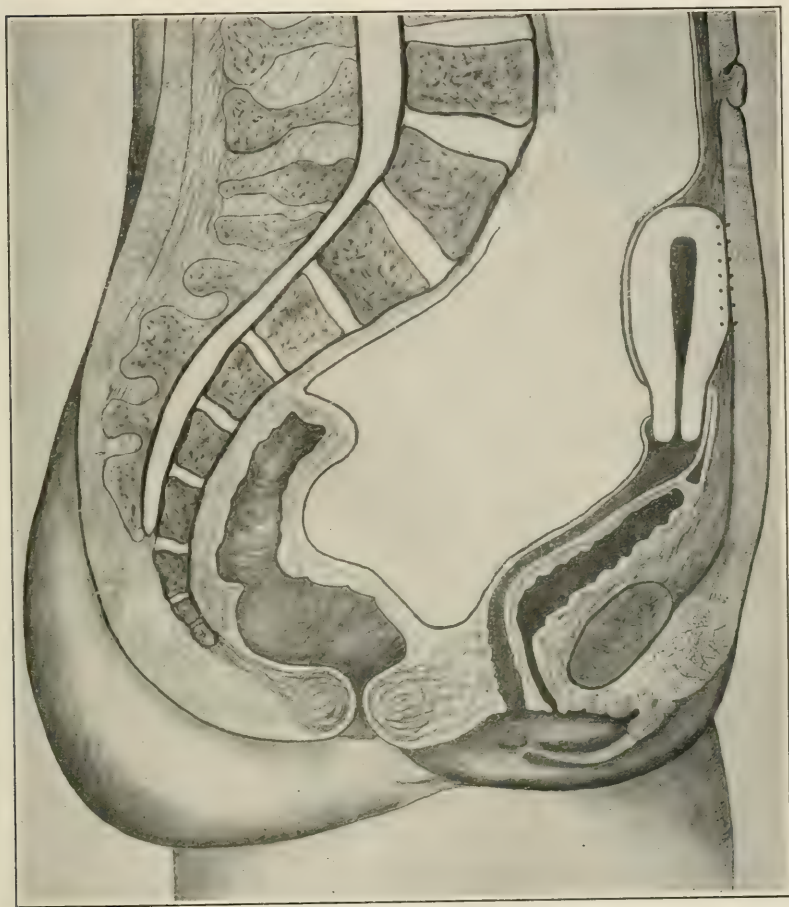


FIG. 1.—A sagittal section of the body showing the position of the uterus after its fixation to the fascia; showing also the elongation of the vagina and dragging up of the posterior wall of the bladder. Two of the six cases operated upon also suffered from very decided vesicocoele. The operation appears to have effectually cured both the procidentia and the vesicocoele in each instance.

ward with running stitches of chromicized catgut. Wherever the corpus and fundus uteri are in contact with the fascia as it is being closed, the stitches are made to include sufficient musculature of the uterus to fix it in its sequestered position.

The sewing of the skin with a running catgut suture completes the operation unless the patient is obese, in which case a small drain is placed between the fascia and the skin and made to emerge from a stab wound 2 inches or more to one side of the incision.



FIG. 2.—Case operated upon one month ago presenting complete procidentia uteri and also a very extensive vesicocoele. Patient aged 58. Uterus had been hanging out of the body for twenty years. After the exact position of the uterus was definitely determined the skin was marked exactly over its location and shows the position of the sequestered uterus at the time of discharge from the hospital.

The application of the usual gauze dressing and adhesive straps completes the operation. The drainage tubes are partly withdrawn in two or three days, but generally not removed until ten days or more after operation.

I submit a drawing in sagittal section of the female body as a schematic showing of the position of the uterus thus sequestered and fixed. I also submit a picture of the last case operated upon.

The marked abdomen shows the position of the uterus thus fixed on the day of discharge from the hospital.

No one should perform the operation of intramural sequestration upon any woman with whom pregnancy is longer possible; but, since we are often asked to afford relief from the symptoms produced by procidentia uteri after the menopause, it will be realized that there are very many cases for whom this operation may be recommended if, on further trial, it is found to possess a special value which I am inclined to attach to it.

26 CHURCH STREET.

A BRIEF REVIEW OF SOME OF THE CONTRIBUTIONS
TO MEDICAL AND SURGICAL LITERATURE BY
GEORGE GRANVILLE BANTOCK, M.D., F.R.C.S.
(EDIN.), FORMERLY SURGEON TO THE
SAMARITAN FREE HOSPITAL,
LONDON, ENG.

BY
I. S. STONE, M. D.,
Washington, D. C.
(With plate.)

TWENTY years ago it was my pleasure to be in London for several months as a pupil of Dr. Bantock, at which time I saw much of the abdominal surgery done in all the hospitals of the great city, as well as that in the famous "Samaritan Free." Several of the medical societies were open to visitors, if introduced by a member, and it was possible to hear and learn much of "Listerism" and of the attitude of the profession in regard to it and toward Dr. Bantock, who had boldly challenged the claims made by its advocates, and in proof of his claims produced results by the use of "simple cleanliness" which surpassed those of the "Listerian" operators.

The work at the Samaritan Free Hospital was attractive, and at that time many physicians and surgeons from various parts of the world attended the operations to witness the excellent work done there. We were brought in daily contact with the surgeons connected with the hospital and owe all of them a large debt of appreciation for the many valuable lessons learned there. But it was the genius and personality of Dr. Bantock which thoroughly captivated the writer. Absolutely devoted to his professional work as he was, and giving it his entire time

and thought, he seemed to have few interests outside of its development and perfection. Even the sports which are usually enjoyed by English gentlemen rarely attracted him after he had become engrossed with the surgical and scientific matters which formed the chief interest of his life. In his family he had the utmost satisfaction and happiness. I was fortunate in having frequent opportunities to visit his home in Granville Place, where were formed ties of friendship which will endure as long as life shall last. If any one judged Dr. Bantock by his dress or his manner to be fastidious, he judged him fairly, for is not this attribute most commendable when combined with unimpeachable integrity and lofty and pure sentiments? His love for flowers has become known wherever he is known as a surgeon, and even now, when most of his time is spent in his suburban home, a large part of each day is given to the care of these favorites. In the years which have intervened since our first meeting we have kept in touch with each other by correspondence and occasional visits, and the inspiration received from him and the many valuable lessons learned while with him have always been helpful and sustaining in many anxious moments.

It is therefore a great pleasure to be permitted to review the more important papers written by Dr. Bantock and to bring again into notice the principles for which he stood, that they may be seen in the light of the present as well as of the past. This work has been a labor of love and affection which must be considered a poor recompense for what has been received and is far less than the subject deserves.

George Granville Bantock was born at Dunrobin in 1837, and was educated at Goldspie, Sutherlandshire. Among the memories of his school life stands out a visit paid by Mr. Gladstone to the school, when Bantock successfully recited passages from Homer and Horace and translated passages from their writings. The eminent statesman was greatly pleased by this and complimented the young scholar, who was then only fifteen years of age. From this school he entered the University of Edinburgh in 1854. In 1855 he accompanied a whaling expedition to Davis Straits, which occupied about five months. Finding that he would be too young to be graduated at the University if he continued his studies without interruption, he acted as an assistant for some time at Newcastle-under-Lyne and at Newport, finally being graduated and becoming a licentiate of the Royal College of Surgeons at Edinburgh in 1861, and Fellow in 1876.



GEORGE GRANVILLE BANTOCK, M.D., F.R.C.S. (Edin).

He first settled in Chester but removed to London in 1865 and began his surgical work there in the London Surgical Home. He was appointed assistant surgeon to the Samaritan Free Hospital in 1877, after having served as physician to the out-patients' department for several years. Bantock and Thornton jointly succeeded Sir Spencer Wells in 1878, and from this time the individuality of the two men asserted itself in striking fashion, as will be noted hereafter.

The circumstances which surrounded Dr. Bantock soon gave an opportunity for the manifestation of that natural independence which found full play during an era which produced some of the most sensational events of any period of medical history. He was well informed in regard to the early history of abdominal surgery. He had learned of the rather startling failure of eminent men such as Caesar Hawkins, who performed an ovariectomy with fatal result in 1846, and allowed this to be his last and only attempt. He knew that the operations at Guy's Hospital by Morgan, Key, and Bransby Cooper were nearly all fatal. He knew that the famous Solly, at St. Thomas, had not succeeded, and later how Baker Brown essayed to practise abdominal surgery, only to recoil from his ghastly mortality list and refuse to operate for a period of two or more years, from 1856 to 1858. At this time, 1857, we learn that Mr. Spencer Wells began operating and with the assistance of Baker Brown attempted an ovariectomy, only to abandon it at the latter's suggestion. He made another attempt the following year, but with poor success, although working with Brown's assistance. This appears to have determined Mr. Wells to try other fields, for he went with the army to the Crimean War, where he saw many of the results of military surgery practised for the relief of gunshot and other injuries of the abdominal contents. It seems that this period of time and experience served to strengthen the desire of Mr. Wells to practise abdominal surgery, for he took up the work at the Samaritan Free Hospital after his return, and gave to the institution, to its attending staff, and to the world the results of his large and hitherto unequalled experience.

The time which comprised the four years of the Civil War in the United States, during which Dr. Bantock was still a very young surgeon, saw some startling innovations in pathology as well as in the technic of surgical work. Many of the materials used for sutures were exchanged for silk, which soon became almost universally used. The most stringent measures were

taken against atmospheric contamination of operating rooms and appointments. It was necessary for each visitor at an operation to affirm that he had not exposed himself to infectious diseases and had not performed autopsies. Rooms, bedding, and clothing were now suspected as means of transportation of the infection which had proved dangerous if not disastrous during all past surgical experience. The belief was universal that the air carried the prolific and morbid elements of infection whose exact nature was not yet known. Mr. Lister was industriously trying to ascertain, by the aid of the compound microscope, the appearance and behavior of the microbes which he was convinced caused the wound infection with which he had to contend. His training for this field may be said to have been inherited from his father, who had done much to develop the microscope. In 1865, the year which found Dr. Bantock in London, the Glasgow Infirmary made the first use of the antiseptic dressings in cases of compound fractures. In 1867, the application of these dressings was used in all the surgical cases in that institution, and it is unnecessary to add that the practice soon became general. It is said that Mr. Lister first used carbolic acid solutions in experimental surgery on a calf. The carotid artery was tied and the wound was cleansed and the dressings kept saturated with the solution.

The most important paper by Lister was published in 1877, a paper which created a profound impression in all parts of the surgical world. Mr. Wells was ready to adopt its suggestions, as he had believed in atmospheric dissemination of infection and contamination of wounds since 1864. He had made great progress in operating in the meantime, and, even before he used the spray, had reduced his mortality to that which most surgeons considered possible only with the "full antiseptic (Listerian) precautions." We must remark favorably on the courage of Mr. Wells, as shown by his candor, in reporting the high mortality of his first hundred ovariectomies which unfortunately showed thirty-four deaths. Every well-informed physician knows that this high mortality is, after all, not an evidence of complete failure, because ovariectomy is performed for a disease that is necessarily fatal unless operation is successful in preventing death.

Dr Bantock had the results of Lister's surgical, experimental and hypothetical work, in addition to the active surgical training under the eye and hand of Mr. Wells, to influence him in the

development of his line of thought, or rather of his surgical point of view. With such vaunted achievements in surgical results constantly ringing in his ears he went to work determined to make a trial of his surgical prowess and to put into constant use that active mental force and clear perception which has everywhere been considered truly remarkable and which has brought him fame in every part of the world where surgery is known. He began his work at the Samaritan with the assistance of Champneys and Thornton, who afterward recoiled from him as from one who was willing to expose himself and his associates to contumely and dishonor, and his patients to the dangers which beset them in bygone days when pyemia and gangrene were always present in hospitals. It was his good fortune to perform some of his early operations with the assistance of Mr. Wells, and we can well imagine the degree of joint interest felt by these men, who, whatever their subsequent differences, were then pioneers in modern abdominal surgery, whose operative results were anxiously awaited by an expectant and hopeful following.

The hypothesis of Lister had fully satisfied every demand of the hour so far as its conclusive and far-reaching philosophy extended. "Full antiseptic precautions" was the talismanic inscription upon every report of surgical results. With this proof of efficient well-doing who dared to say that all was not done which might insure the most satisfactory wound healing and perfect surgical cure? The use of the spray in the operating room and upon its appointments, including the operator and assistants as well as the visitors before their entrance into the operating room, was regarded as essential to good results. The cleansing of the skin of the patient and the hands of the surgeon and assistants was duly enforced by the Listerian operators, but was not considered as more important than the use of the spray of carbolic acid and the employment of large quantities of cotton wool, through which the germ-laden air could not pass to the line of incision. Chemical preparations, such as carbolic acid, which was preferred by Lister, were considered absolutely essential as antiseptics and for the sterilization of sutures. At this time it was considered heretical for anyone to doubt the efficiency of the Listerian precautions against infection, and Dr. Bantock was so keenly sensitive to the failure to secure perfect results in his early work in ovariectomy that he consented to try the spray according to the well-known directions of Lister. Not being

fully satisfied that carbolic acid was a safe agent, he adopted a suggestion of Thiersch and used a solution of thymol in the form of a spray, having a fatal result in his first trial. He afterward found it necessary to make a change to carbolic acid spray, as the Thiersch solution proved inert, and he continued this with some modification until he became fully satisfied that it should be discontinued.

The result of this experimentation was the settled conviction that cleanliness and not the use of antiseptics was the first essential in surgery. Dr. Bantock's followers received the impression that it was better to wash away dirt, including germs, by mechanical means, rather than to use antiseptics. He appeared to think that the mere universality of the microbes rendered it impossible to locate them or sterilize them, even if they were the cause of infection, which he denied. In person and by habit Dr. Bantock was instinctively cleanly. It was not his practice to examine patients in his office or in the hospital before he went to the operating room. His work was done in the early morning, and, moreover, he rarely came in contact with the virulent or infectious cases usually seen in hospitals where all classes of gynecological patients are admitted. The Samaritan Free was a small hospital, located in Seymour Street, West, and was always full of patients with tumors rather than those with pus tubes or with the results of induced abortion. Ovarian tumors are not usually filled with infectious material, although they are frequently closely attached, and occasionally communicate with the intestinal canal. Therefore, to any fair-minded person, it should be easily explained how aseptic surgery was possible, and is possible now as it was then under similar circumstances.

Dr Bantock's successful work in abdominal surgery had won for him a high place among the world's great surgeons at the time of my first visit to London in 1888, and he then was having that wonderfully successful series of ninety or more ovariectomies without mortality. He had won his great victory against the use of the carbolic acid spray and "Listerism," and it would have seemed natural for him to show a disposition to boast of his work and his success had he been so disposed. There was no evidence of personal pride, however, nor a feeling that he was more fortunate than other surgeons, but rather what might be called satisfaction on account of the triumph of a right principle.

His patients were placed in recovery rooms with one nurse, who

must stay on duty until some days later, when the patient could be left alone or could be sent back to the ward with the others. We saw here the benefit of his after-treatment, especially of the methods used to secure bowel movements. One patient had bowel obstruction after a very prolonged and difficult operation, and would in most hospitals have had large doses of cathartics in order to induce peristalsis. But in this case she was not made to suffer by the use of purgatives, and after the first trial and failure all such means were discontinued and enemas alone were given. We had the satisfaction of seeing this case recover after several weeks of uncertainty about bowel obstruction, during which time all food and drink by the mouth was discontinued. It is positively certain that this patient must have died had she been subjected to the usual course. I am glad to observe that during the past five or ten years many surgeons have followed this simple and efficient (may I not say enlightened) plan of not giving purgatives by the mouth when there is vomiting or bowel obstruction. The technic used by Dr. Bantock is so well known that we need not describe it here. That he used sulphurous acid and glycerine, or alcohol in certain instances, as about hysterectomy stumps, or elsewhere, in case of suppurating wounds or odorous discharges, is a matter of general knowledge and has given rise to the assertion that he used "antiseptics" in surgery. Everyone who observed his work knows that the use of antiseptics in surgery was entirely laid aside with the spray, or very soon after its use was discontinued. Moreover, his use of a disinfectant to destroy a four odor was not an admission that antiseptics were necessary in surgery proper, nor did such use involve a belief in the potency or danger of microbes.

Noted below are the more important papers contributed by Dr. Bantock, all of which show his strong personal characteristics, particularly his intense conservatism. He was never known to adopt a new remedy or method without due consideration and careful examination. He was in no sense an experimentalist, but conviction always ruled with him, and once he had formed an opinion, it must have been exceptional that he was wrong or that he was easily moved to the adverse view. The first of all obligations in his mind was his duty in trying to lower the mortality in ovariectomy and supravaginal hysterectomy. The technic of operation must be perfect to accomplish this end. The use of antiseptics was repugnant to him and he soon became convinced that harm was done by them.

The inaugural address on "Listerism" should be noted first because it contains the essential facts which sustain Dr. Bantock's opposition to the use of the carbolic acid spray and to chemical antiseptics generally. Next to this in importance and with direct relation, is the report of his ovariectomy work. "Hyperpyrexia after Listerian Ovariectomy" was also an epoch-making paper, and a plea for early ovariectomy and drainage in ovariectomy. It was likewise an important paper in that it showed a clear strong grasp of a difficult subject. The papers on "Gonorrhea in Women" and those relative to the pessary came after he had clearly established his position in regard to antiseptics. The paper on "The Treatment of the Pedicle in Hysterectomy" was read before the American Gynecological Society and attracted widespread attention at that time. The paper on "Modern Bacteriology" came later, and, as will be seen, contains a resumé of his views, which is a strong presentation of an adverse position to that generally held by most pathologists.

It is a pleasure to add to these papers a few of a personal or appreciative character which come mainly from sources outside of Great Britain. Finally, a fairly complete list of Dr. Bantock's paper is added, which show that he was a liberal contributor to the medical literature of the time.

INAUGURAL ADDRESS ON "LISTERISM."*

"Listerism," says Dr. Bantock in his inaugural address (read before the British Gynecological Society, January 26, 1887), "is founded upon the hypothesis that ordinary atmospheric air contains germs or seeds of disease, which, falling upon the field of operation, develop there and in that development are answerable for the majority of unsuccessful results of surgical practice." This quotation shows the main or central idea which he held to be useless and even dangerous when applied in surgery and especially in abdominal surgery. At the time of the address, Dr. Bantock had achieved a remarkable degree of success in ovariectomy and was triumphant over intense opposition, even of those who had formerly been his friends. He had been warned that his course was inevitably alienating, otherwise good professional support, and that he would suffer dire results if he persisted in such a reckless disregard of Lister's theory. He was well aware of this opposition in the committee of the Samaritan Free

* Twelve years since inaugural address on "Listerism."

Hospital, and was informed that the staff were expected to adhere to the established technic. The use of the spray was considered so essential at that time that in certain parts of Germany and Russia criminal proceedings were suggested against those who refused to employ it. It must be admitted that the preservative power of carbolic acid was understood and admitted by Dr. Bantock and those who agree with him, but they insist that it is destructive when applied to living tissues. The destructive or antiputrefactive nature of carbolic acid was established by its use in destroying the penetrating and disgusting odors arising from the corpses of cholera subjects hastily buried near one of the hospitals in London which were partially uncovered during building operations. Plenty of carbolic acid and a deep layer of earth saved the corpses (from removal) and also the situation, and impressed everyone with the far-reaching efficiency of the new preservative disinfectant. It is interesting to note the fact that Mr. Tait at first adopted the spray, and he continued to use it for some time after Bantock had laid it aside. Von Bruns of Tübingen, in 1878 and 1880, wrote an article called "Fort mit dem Spray," in which he demonstrated its inutility.

Bantock's mortality under the spray was large, for of thirty-six cases he lost eight, or 22 per cent. Three of these showed unmistakable symptoms of carbolic acid poisoning, one of them having acute suppression of urine, although she finally recovered. After this he greatly diluted the solution used and obtained a constantly lowering death rate. The "vanishing point" of the spray was reached in 1880, or about two years after his election as full surgeon to the hospital. The opposition to him now grew apace and so determined were his opponents that he was defeated for fellowship in the Royal Medico-Chirurgical Society, although he was supported by Mr. Erichsen and Mr. J. Hutchinson, "besides other well-known and able men." The prime and immediate cause of this rejection was his paper on "Hyperpyrexia after Listerian Ovariectomy," in which he conclusively showed that "cleanliness after all is the true secret and merit of Listerism." He says of the rejection: "Little did they think they were paying me the highest compliment in their misdirected power." Dr. Playfair has stated that as early as 1886, in at least one large hospital in London, the spray had been discontinued. When in London in 1888, I found Mr. Lister operating with the continuous irrigation method, having

abandoned the spray. The Continental surgeons were generally using it, although signs of its discontinuance were not wanting, in that we, the visitors, were sprayed, but the operating room and patient did not require it during the time of operation.

Let us be explicit, however, and not let it appear that the above remark means any change in Dr. Bantock's opinion of the significance of the presence of bacteria in wounds, for he would rather believe their action "beneficent" than deleterious. The Metchnikoff theory of phagocytosis comes in for a share of comment as follows: "It was far too circumstantial for my ideas of what was possible in the way of microscopical demonstration, much too clear to be regarded as anything but the product of a lively imagination, much too like seeing through a millstone, for my acceptance" (page 45). Professor Buchner is quoted, who says (*Med. Press and Circ.*, Lond., Apr., 1898): "I now believe the theory of phagocytosis as propounded by Metchnikoff and his disciples to be insufficiently supported by evidence."

With reference to the mosquito as a carrier of disease, we find that Bantock is yet unconverted. It may seem to us that the weakness of the germ theory, as applied to surgery and pathology, should not be held as a parallel to the biological revelations regarding the plasmodium of malaria. The writer of these lines has often had doubts similar to those of Dr. Bantock regarding the essential first subject from whom the "carrier," the mosquito, obtains the parasite. Yet we are bound to believe that yellow fever and malarial patients should be screened carefully, in order to prevent possible distribution of the disease.

Quoting Lord Lister himself, who said at the International Medical Congress at Berlin, "By means of the phagocyte theory of Metchnikoff (now exploded) we can account for what would otherwise have seemed to me incomprehensible—the use, without evil consequence, of silk ligatures which have not been subjected to any antiseptic preparation Dr. Bantock, whose remarkable series of successful ovariectomies may seem to justify his practice, does not, I believe, prepare his ligatures antiseptically. The success achieved by Bantock and Tait, without, it is said, the use of antiseptic means, proves a stumbling block to some minds As regards the spray, I feel ashamed that I should have ever recommended it for the purpose of destroying microbes in the air." Bantock here, as he is everywhere, characteristically honest and frank, pays his debt of homage to Lord Lister for his "candor and honesty" in con-

fessing his error and in exhibiting such a state of "openmindedness, seeing that such a confession of error must detract from the credence we should otherwise give to his later views."

THE TREATMENT OF THE PEDICLE IN SUPRAVAGINAL
HYSTERECTOMY.

In a paper entitled "On the Treatment of the Pedicle in Supravaginal Hysterectomy" (Repr. from Am. Gynecological Transactions, 1887, vol. xii), Dr. Bantock tells us that having decided to remove fibroid tumors of the uterus by abdominal section, he waives all discussion of other matters bearing upon the operation except the method of "treating the pedicle." He had seen nearly all operations done by ligature and dropping the pedicle prove fatal from hemorrhage, although these were mainly pedunculated tumors. Therefore he was keenly on the alert to adopt a better and safer way, and one giving him absolute control of the arterial supply of the uterus and tumor alike. The experience of nine years had developed in Dr. Bantock's mind certain definite ideas. Having followed Baker Brown and those who used the actual cautery to secure hemostasis, he practised this method in his first case, searing the pedicle over the clamp. The clamp failed to hold the parts and the stump retracted and had to be ligated and surrounded with peritoneum in an effort to prevent contamination of the peritoneum. The patient died of "septicemia in spite of the strictest observance of Listerian details."

Bantock was impressed with that quality of the uterine tissues which allows "shrinking under pressure, so that in a few hours a ligature which has been tied with all the strain it will bear, ultimately becomes quite loose." He promptly abandoned the clamp and cautery and in the next case after failure with the ligature applied a "serre-nœud" with success. This was his first use of Koeberle's "serre-nœud." He says: "I was thus feeling my way, as it were, in the dark, and I had got so far that opinions regarding the ligature, derived from my first case, were more than confirmed." He laid aside the Cintrat serre-nœud, which had not been found strong enough, and relied upon the Koeberle instrument after some modifications of his own. He lost his third case, even with the serre-nœud, owing largely to concealed hemorrhage. But here it seems that the usefulness of the instrument was fully comprehended, and he took no back-

ward step but resolutely used it in his after-experience, with the result that the mortality from this method proved a new record, far better than was ever thought possible in hysterectomy. His use of the transfixing pins proved of inestimable service and he learned never to cut away the tumor before the pins were inserted. His statistics at that time were most satisfactory—indeed they were remarkable—and we give them here because they were then unequalled.

Supravaginal hysterectomy by extra-peritoneal method, fifty-seven cases, forty-five recoveries, twelve deaths.

Six of the deaths were from kidney disease; one from acute enteritis; two from hemorrhage; one from obstructed intestine; two from peritonitis and septicemia.

Hysterectomy by extraperitoneal method, thirteen cases, all recovered.

Hysterectomy by enucleation, etc., two cases, recovered.

Cases treated intra-peritoneally, five cases, one recovery, four deaths.

GONORRHEA IN WOMEN.

In a paper on this subject read before the British Medical Association in Birmingham, July, 1890, Dr. Bantock shows his opposition to Nöggerath's conclusions by quoting Thornburn in opposition. Thornburn showed the "merest fractional difference in the number of abortions, sterility, uterine and pelvic inflammation and living births, in the infected and uninfected families. As regards inflammatory pelvic operations, the balance was fractional in favor of the "nongonorrhœic." The inability manifested by bacteriologists to agree as to the number of microbes called gonococci, causing more or less confusion as to diagnosis, has given Dr. Bantock some support in his objection to their claim that gonorrhea is always a germ disease. The "latent" variety, or that which flares up after marriage, showed to his mind that gonorrhea could exist without the demonstrable presence of gonococci, and that while the absence of gonococci proved nothing against the gonorrheal nature of the disease, the presence of diplococci, "seeing there were several varieties indistinguishable from one another," did not prove it. Säger and Sinclair admitted the difficulty of finding the gonococci at that time, and we are constrained to say that it still remains. Dr. Bantock soon ascertained that gonococci could not be found in even a few months after an acute

attack had involved the pelvic organs of women. He takes some comfort in Nöggerath's more recent withdrawal of his declaration of 1887 that the disease is incurable, a position which Säger had declared untenable in 1884.

In speaking of the route selected through which the infectious germs pass, Dr. Bantock can see no good reason why the urethra of the female is not involved while the vagina and uterus are affected, and he cannot believe that the serious intrapelvic complications, so often seen, can be due to gonorrhea without discomfort during micturition. The apparent disinclination of our friend to accept the gonococcus as *the* cause of the disease does not cause him, he says, to "minimize the importance of the disease, much less of denying its power of evil; or that it is capable of producing salpingitis, with its various results, ovaritis and pelvic peritonitis even, to a fatal termination." His observation of this disease leads him to believe that the germs, if present and a cause of gonorrhea, should produce definite results. They appear ubiquitous to him. Sometimes they cause infection and at other times they do not. The numerous cases of ophthalmia neonatorum show him that if this malady is the result of gonorrheal infection, then the infection must have taken place after the pregnancy had begun. Otherwise he assumes that it is only a coincidence of an accident, that gonorrhea and sterility ever stand in the relation of cause and effect. In fact he is very skeptical as to the relation of gonorrhea to sterility in either male or female, although he does not deny such a possibility.

IN DEFENSE OF THE PESSARY.

An examination of papers written by Dr. Bantock on the use and abuse of the pessary shows the practical rather than the theoretical view of the subject of uterine displacements. In other words, he gives but little attention to etiology, about which so many gynecologists are concerned, and even in his last paper, entitled "In Defense of the Pessary," he says: "A great deal has been written about the causes of uterine displacements. I particularly refer to retroversion. I do not see how any knowledge of this kind can help us in the least in the matter of treatment. We are not called upon to prevent displacement, but to remedy it, except in the case of a patient who has been the subject of displacement previous to a pregnancy which had

been brought about, perhaps, or at least aided, by the application of a pessary—of which I have seen many examples.”

This stroke at the special pathology of uterine displacements needs no comment, except that one may almost despair of finding the cause of these displacements, as in many other difficult problems, which have in the past and will always continue to occupy the time and thought of those who wish to prevent disease of any kind. Dr. Bantock claims that retroversion is the only displacement worthy of consideration. Notwithstanding his aversion to discussing the etiology of displacements, Dr. Bantock gives us the kernel of the nut in the treatment of uterine displacements by pessaries. The prevention by posture treatment after delivery is strongly urged. He, like many gynecologists, believes that numerous retroversions are caused by falls. He insists that the only way to treat an uncomplicated retroversion is by means of replacement, and then proper adjustment of a pessary. The tendency to operate by any one of the modern methods of ligamentary shortening, ventrosuspension, or vaginofixation, are all equally objectionable to him.

Without entering upon a discussion of the merits of his views upon uterine displacements, we must pay especial attention to one remark made by Dr. Bantock which nearly corresponds with the views of many gynecologists who think a retroversion but a part of a general malady. On page 8 of “Defense of the Pessary,” he says: “In all cases of retroversion there is a certain amount of descent of the uterus.” This is to the writer a satisfactory proof that there is a special pathology behind the retroversion, the cause of which ought to be known if we ever learn to prevent or permanently cure these abnormal conditions. Descent of the uterus with retroversion is often associated with cystocele and relaxed or torn vaginal outlet. Besides these, we know that the majority of abdominal sections are performed by many gynecologists who try surgery for retroversions, because intrapelvic or abdominal work is required. We are, however, like Dr. Bantock in trying the conservative plan in all cases where it is applicable, and invariably in young women who may become impregnated.

His use of the uterine sound in certain cases is certainly to be commended. It is manifestly impossible to restore the retroverted uterus in a stout subject by bimanual effort alone without anesthesia, and Dr. Bantock is right in saying that the sound is the best means for this purpose. This instrument

is abused because it was formerly used when unclean, or when the patient had salpingitis; in any event, it was a common error to fail to detect intrapelvic disease, which even a tyro would recognize at the present time.

No better treatment of the use of pessaries has ever been written than that which we find in Dr. Bantock's book and in his papers on the subject. He prefers the Albert Smith modifications of the Hodge pessary and opposes the ring variety. We note his use of a special instrument for cystocele, called the diaphragm pessary, which is described in his book, but which has not been used by the profession generally. As the restoration of the perineum is admittedly cured only by operation (as no pessary gives satisfactory temporary or permanent support), so I advise operation for cystocele with as much confidence in my ability to give good results as I feel when performing any gynecological operation whatever. Dr. Bantock's disbelief in anteversion of the uterus is strongly and tersely stated, and, indeed, very few men, in this country at least, maintain the old idea of anteflexion and anteversion, or the possibility of curing such cases by pessaries or other means. It is hardly, however, a "hopeless expectation" that these pessaries will disappear. He regards anteflexion as a malformation, and its treatment by the intrauterine stem is very cautiously advised in rare instances. He has long since given up any cutting operation for the cure of cervical stenosis, and prefers gradual dilatation. One can well remember his characteristic indignation when he spoke against certain unnecessary operations, and, apropos of cervical operations, we can imagine how he would express himself in regard to the posterior incision by a Liverpool gynecologist or by H. P. C. Wilson of Baltimore, or that of Dudley of Chicago; or the bilateral splitting of Pozzi's in 1909.

A PLEA FOR EARLY OVARIOTOMY.

For comparison of views regarding the necessity for early ovariectomy, I quote what Dr. Bantock says of Sir Spencer Wells' "important practical conclusions." Wells said, "so long as an ovarian tumor does not materially interfere with the appearance, prospects, or comfort of the patient; so long as no injurious pressure is exercised by it on the organs of the pelvis, abdomen, and chest; so long as heart and lungs, digestive organs, kidneys, bladder, and rectum perform their functions without

much disturbance; so long as there is no great emaciation, no very wearying pain, no distressing difficulty in locomotion, or so long as any such injurious influence can be counteracted by ordinary medical care, the patient should be left to that care, undistressed by surgical treatment." (See "Diseases of the Ovaries.") Six years later Wells repeated this advice as follows: "So long as the patient is moderately comfortable, so long as she can walk a mile or for half an hour, without much inconvenience; so long as she can get up and down stairs; so long as there is no great pressure upon any of the organs of the abdomen or pelvis, and she can breathe pretty well, and her heart is not interfered with, such a patient as that may be left to ordinary palliative treatment with the usual attention to the general health."

Peaslee also pleaded for delay, and thought peritonitis far more to be dreaded in the early operations. He thought only the impairment of general health should indicate the necessity for operation. Thus we see that Wells, Peaslee, West, Atlee, Bradford, Tyler, Smith, Erichsen, Nelaton, and Nussbaum were on the conservative side, while Keith, Hutchinson, Spiegelberg, Baker Brown, and Kœberle, besides Bantock, favored early operation before the general health has become enfeebled. Even Gaillard Thomas appeared to favor delay.

In this matter of ovariectomy, Bantock made the following propositions (1881):

1. We should not wait till the patient's general health has become impaired.
2. The presence of the tumor is the cause of structural disease in other organs.
3. Ovarian tumors are liable to accidents and changes (which he enumerates).
4. Adhesions and degenerative changes interfere with the success of the operation.
5. The earlier and simpler the operation the greater the chances of recovery. In short, operation is indicated as soon as the diagnosis is made.

The arguments set forth in support of these five propositions are clear and to the point and unanswerable, as is shown by their universal adoption. They not only serve as applied to ovariectomy, but may be, and indeed are, applicable to many other operations.

Bantock's allusion to the tendency of ovarian tumors to pro-

gress toward a fatal result should have needed no additional support to prove the position he assumed. No other argument was necessary. Such operations are never mere expedients—they are always absolutely “necessary.” In reviewing the subject, Dr. Bantock takes up each feature of the so-called conservative ovariologist’s policy and fully exposes its weak points. The condition of the kidneys, the volume of urine, the presence of albumin, ascites, dropsy of the chest, torsion of the pedicle, rupture of the cyst, etc., are all considered, and in almost every instance abnormal or pathological changes could have been avoided by resort to early operation.

Bantock was also among the very first to discontinue the practice of tapping ovarian cysts, having decided upon this course far in advance of most surgeons. (See “A Plea for Early Ovariectomy,” 1881, p. 26–29.)

DRAINAGE IN OVARIOTOMY.

It was thought possible that Listerian methods would preclude the necessity for drainage, and here the battle waxed hot for a time between the two schools of thought and practice. The use of the clamp, with external treatment of the pedicle, often provided an opportunity for drainage and probably suggested the principle of discharging purulent collections, blood or serum, from the pelvis by way of the vagina. Mr. Spencer Wells probably was among the first to do this. Dr. Sims (*New York Medical Journal*, 1872.) was the first to use a drainage-tube through the vaginal vault. He used the tube without reference to the question of bloody collections, but rather to secure the pelvis from infection, for the result of dropping the pedicle was not yet settled. There was fear of concealed intra-abdominal hemorrhage and this did much to bring the drainage tube into use. Dr. Bantock instinctively disliked the vaginal method of drainage, and soon followed Kæberle, who first used the glass tube inserted through the lower end of the abdominal incision into the culdesac of Douglas. He said when there is “oozing of blood or serum, or when some of the contents of the tumor had escaped in the peritoneal cavity, then drainage is demanded.” The use of the drainage-tube appeared to be a great advance over previous methods. Its use relegated the clamp into final oblivion, for to use both was not longer to be thought of. The tube served a good purpose in more than one respect. It gave evidence of excessive hemorrhage and it

showed the operator what large quantities of blood and serum were discharged from raw surfaces or from the peritoneum itself. Dr. Bantock allowed the tube to remain in any case until the serum was not bloody, and in fact until the color was quite pale and clear. This often required four days or even longer. In certain cases a smaller rubber tube replaced one of glass and was allowed to remain for a day or two longer. A glass syringe with small rubber tube was used to "suck" out the fluid through the tube. In this way many ounces of blood or serum would be discharged. Bantock preferred the Keith tube, and it grew in favor almost everywhere. For a time Dr. Bantock used a sponge wet with carbolic acid solution over the upper (open) end of the tube. This was evidently a concession to the prevalent Listerian idea, but the practice was not long continued. We note that he says that the presence of "sickness" after operation is desirable, as it expelled collections of fluid from various locations toward the drainage-tube through which it could be drawn out by suction. One fatal case is mentioned in which there was no "sickness"; the collection being found afterward in the vicinity of the diaphragm (subdiaphragmatic). The drainage-tube was relied upon in the complicated cases only, and was used even in those cases which were flushed with more or less water. Flushing, however, never caused Dr. Bantock to entirely discontinue the use of the drainage-tube in selected cases, for its use is quite as philosophical or rational to-day as it was twenty years ago.

In *La Galleria Della Clinica Obstetrica* (Rome, vol. 1, 1902) is a brief biography of Dr. Bantock by Prof. Felice La Torre, containing a list of his most important contributions to gynecological literature. This paper, evidently written during the sessions of the International Gynecological Congress at Rome, is far more laudatory than any other that has come to hand, and, coming from one who is entirely free from local influences, may be said to be just, although exceedingly appreciative and highly eulogistic. We quote it in part, as follows:

"George Granville Bantock is, beyond dispute, the handsomest and most sympathetic of the class of obstetricians and gynecologists, of which in truth the cultivators are not, in the majority of cases, after the form of Apollo." He then alludes to the flowing beard, turning to silvery white, and the flower in the button-hole of the elegant frock coat, with other details with which all of us are familiar and love to remember. Torre met Dr. Ban-

tock in 1894, at the International Medical Congress, and a second time at Geneva, in 1896, and found him "still wearing his flower in the buttonhole of his coat." We are glad to note Torre's remark that these characteristics meant nothing "frivolous," for Bantock "is a man universally appreciated and esteemed for his knowledge." This remark appeals to us strongly, for one had only to observe him casually to learn that his thought was of the purest and noblest and often of the most serious character. "Most neatly dressed," says Torre, "he is the very opposite of those who, badly dressed, excite in the aristocratic class of clients a sense of repulsion. The medical man, and especially the gynecologist, ought to be neat, elegant, and Bantock with this outward neatness, of which he is a master (knowing its value admirably), unites an elegance of aristocratic manner, an exquisite beauty of soul, and a vast culture, so as to form a true gentleman and a perfect gynecologist. Tall of person, well formed and of a graceful bearing, he is one of the handsomest men I know." And again, "The tenacity and absolute conviction with which he holds to his views is exceptional, and under certain circumstances, and in the defense of his opinions in combating popular prejudices, he frequently had recourse to vehemence and force, conditions necessary for the domination of minorities. As a scientific man he is held in the highest honor, and two things, principally, tend to increase his prestige in the medical world, indicating his characteristics.

The first is that he showed himself from an early period most hostile to all that we call Listerism, and, like all those who do not pin their faith to popular creeds, he combated it with energy, despising its exaggerations. . . . The second fact which increases the fame of Bantock is that he was called by the unanimous choice of his colleagues to the presidency of the British Gynecological Society, succeeding Lawson Tait.

"Here we have in very few words the man of science. His brilliant and fortunate career is an example, moreover, of his strong British temperament, showing us how one can become anything with perseverance in precise ideas and in subjecting oneself to hard and continuous work. Bantock is, in short, a giant who owes all to himself, and how different from so many mediocrities who leap into high favor through shameless favoritism, without which they would forever remain shut up in the burrow which they hollow out in the earth, without ever seeing the light of science because they are devoid of intellectual eyes."

MODERN BACTERIOLOGY.

Dr. Bantock's most important and final word on the germ theory of disease was issued in 1902, entitled "The Modern Doctrine of Bacteriology, or the Germ Theory of Disease." We read in the second edition of this pamphlet that the first edition was exhausted and the second demanded by numerous requests of scientific men in and out of the medical profession. It is not to be supposed that any opportunity was lost to gain information which might reinforce the writer in the views which he expressed before, and it should be interesting to learn what he regards strong evidence in favor of his position. It is in this book that Dr. Bantock calls attention to a discussion which occupied the correspondence columns of the *Medical Press and Circular* two years before, on the Modern Doctrine of Bacteriology which arose out of the question, "What is Listerism?" He says: "No follower of Lister, no modern bacteriologist, dared to enter into that discussion, or, if there was such an one, who had the courage to disclose his name.

The bacteria he regarded as a product or result, not a cause of disease. The bacilli are formed in association with the disease, *because of the disease*, or because it furnishes the conditions necessary for the presence of the special microorganism. Dr. Boucher, in an article entitled "On the Absolute Insufficiency of the Hypothesis of Contagion by the Microbe" (*Jour. de med. de Paris*, Mar. 9, 1902), says: "One of the causes of the extraordinary spread of bacteriology among all classes is, undoubtedly, the simplicity of its fundamental hypothesis, the pathogenic microbe, by the aid of which it explains all the morbid causes which traditional medicine has been unable, so far, to elucidate sufficiently. To-day the matter is clear, the phenomenon is explained, and everybody since the time of Pasteur, from the lowest to the highest, understands that typhoid fever is born of the typhoid bacillus; that diphtheria proceeds from the diphtheria bacillus, just as, since the time of Molière, everyone readily understands that if opium produces sleep it is because it assuredly possesses actual soporific virtues.

"And yet this seeming simplicity conceals in reality veritable bogs, and reason finds itself at every step murdered by impossibilities, contradictions, nonsense. In reality, the hypothesis of contagion by the microbe is nonsense, it only serves to conceal from the eyes of the faithful the horrible void in the doctrine;

it renders the problem of etiologies impossible of solution, and, moreover, explains nothing."

He quotes Férá, saying: "The secondary phenomena which medicine studies are governed by the same laws, by the same principles as the fundamental phenomena which are the object of physics, and when one has comprehended the intimate relations existing between everything and the sublime harmony which results from them, it becomes difficult to listen without pain to the bacteriological lucubrations, the histories of microbes, the theories of disinfection, the pulverisations, etc., and to look on unconcerned at the apotheosis of foolishness, of ignorance, and madness."

Br. Bantock extends his opposition to the "hypothesis" so far as to suggest that the bacteria may have a beneficent action in wounds, and mentions illustrative cases where a "copious crop" of the *staphylococcus pyogenes aureus* was present throughout the wound which healed without untoward results—as he says, "the rapidity with which they healed up was truly marvelous." On page 13 we find his well known reference to the character of the serum drawn from drainage-tubes, in which were found numerous pathogenic organisms, such as streptococci, *bacillus coli communis*, etc. As perhaps nearly every one knows, such findings prove the presence of the microbes, but why they were thought dangerous and the cause of disaster at one time, and at another quite passive, and satisfied with the good work of repair and cure, without asserting their dangerous nature, was at least puzzling to anyone, even the bacteriologists themselves. That these bacteria were "pathologic only under certain conditions," afforded Dr. Bantock no reason for changing his attitude toward the hypothesis previously mentioned, and he regarded this as an evasion or subterfuge. We cannot fail to understand his reason for doubting the evidence of the bacteriologist that the presence of streptococci "invariably portends death," for had he not seen the cases recover who furnished the infected serum? Dr. Bantock refused to sanction the germ theory, largely because he could not believe the bacteria pus-producing agents. He mentions instances where chemical irritants produce sterile pus—at least pus minus the bacteria. In speaking of the presence of bacteria, he was unwilling to grant that they could be the cause of any one of the various diseases at one time, and not all the time, or that they could be present a long time subsequent to the recovery

from disease (as in the case of diphtheria), and prove innocuous alike to patient and to others. He does not deny the association of the bacteria with the disease as an evidence of its presence at least, but insists upon the reverse of the customary reasoning, and regards them as altogether a result of disease. Neither can he accept the idea that healthy children could serve as carriers of diphtheria without themselves becoming victims of it. Dr. Bantock will be considered a heretic by those who consider the gonococcus responsible for the production of disease, and he calls attention to the absence of microbes in nearly all cases of pyosalpyx. The fact that vulvitis in children shows the presence of gonococci in 76 per cent. of cases, as stated by Dr. Robinson before the Obstetrical Society of London (*The Modern Doctrine of Bacteriology*, page 22), seems unreasonable, as the results are rarely if ever so damaging as those seen in adults. He therefore believes there is a mistake in the identity of the microbes.

In his comments upon the relation of bacteria to typhoid fever, Dr. Bantock has made good use of the unhappy failure of many investigators to find the suspected germs. He is not satisfied with a "begging of the question," as he calls it, when they say that a failure to find the bacilli affords no evidence against the view that the disease was conveyed in the water. (May not the absence of bacilli in the water have shown the necessity for searching elsewhere for the cause?) The rather indefinite results obtained by bacteriologists who search for typhoid and other bacteria in atmospheric air (air-borne bacteria), such as emanations from sewers, etc., has given Dr. Bantock a good opportunity to hold them up rather severely to either censure or ridicule. Having done so much to show that "hospital air" did not carry infection to his patients, it was not surprising that he could find no rational excuse for the deposition of "a teaspoonful of so-called disinfecting powder around the gratings at the sides of the streets" at the sewer connections, or that he called the practice "an idiotic proceeding." He would naturally regard the expert evidence furnished by the bacteriologists themselves as to the relative absence of microbes in sewer air, and he quotes from the report on the "drainage committee" of the common council in proof of his position (See page 34). He was perfectly aware of the process by which impure water finally becomes pure and says (page 38) that the bacteria, although few in number, may multiply under favorable conditions

(as when water is confined), until they exhaust the "pabulum" upon which they feed, after which they die and the water becomes "sweet."

THE PRESENT POSITION OF ASEPTIC SURGERY.

Brit. Med. Jour., London, 1904, ii, 950.

Bantock points out that some writers try to reconcile the terms "antiseptic" and "aseptic" as being synonymous. He shows that the former term was used when chemical substances were used to destroy microbes that might gain access to wounds; that for a long time that was the only and legitimate meaning of the word. But ere long, it was found that microbes resisted an amount of the so-called bactericide that would destroy the tissues themselves. Then came the search for a substitute, which failed, and finally it was found advisable to avoid altogether the application of microbicidal substances to the raw tissues. The term "antiseptic" was therefore no longer thought suitable, and in the desire to keep the idea of sepsis before the mind, the term "aseptic" was invented.

He objects to the term "aseptic" as applied to an operation that has just been completed.

It is correct to say, on the completion of an operation, "that is an antiseptic operation," it is only worthy of ridicule to say, under the same circumstances, "that is an aseptic operation," and for the simple reason that one has to wait for the result to know whether it proves to be septic or aseptic.

He agrees with those who say, "Asepsis is the end, antiseptics the means," and that "the employment of heat is just as truly an antiseptic measure as the use of bactericidal chemicals." But you cannot apply heat to the patient, not even for the so-called disinfection of the skin. Hence the terms are not synonymous; they are antithetical and therefore antagonistic.

He again alludes to his remarkable record of ninety ovariectomies without mortality, during which time there was a considerable mortality in the antiseptic wards of the same public hospital.

In a later communication Dr. Bantock replies to questions referable to his technic (see p. 114) which he gives. Dr. Cannon asks about "ligature abscess" or "stitch abscess." Dr. Bantock shows how a "stitch abscess" will follow tight sutures, as they

strangulate the tissues. This does not, however, affect the healing of the wound proper by "first intention."

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LETTERS FROM GEHEIMRATH A. MARTIN AND T. V. WINCKEL.

DEAR DR. STONE:

You are quite right in supposing that I feel a very sincere and deep appreciation for Dr. Bantock. I met him first in the "Samaritan," aside of Sir Spencer Wells, in 1872, and ever since, when passing through London, I have arranged to see Doctor and Mrs. Bantock, who have received me with the most gracious hospitality. He has retired, but does he not do any work in private practice? What a pity for his patients, he was such a brilliant operator and a most amiable attendant. I sincerely acknowledge Dr. Bantock's high position as a scientific man, even when I feel unable to follow his view of the modern development of antisepsis and asepsis. This has been undoubtedly, practically inaugurated by Lord Lister, scientifically by Rob. Koch. The mistakes of what is called "Listerism" have radically changed in the course of this development. Bantock has been quite right, as is proved by universal experience, to decline the spray and carbolic acid. This we frankly acknowledge. We have all ended to-day, in asepsis, varying in a multitude of minutiae. Cleanliness alone, as Tait used to exclaim and as Bantock continued to say, does not do, according to the view of certainly all German surgeons. We want a more thorough washing and sterilizing of hands and instruments, rubber gloves, etc. As to the scientific part of the question, I absolutely differ from Bantock's prior views. Bacteriology is only in the beginning of its explorations. Every step forward shows new perspectives looming up. However, Bantock still stands by his theories

and the results of his own investigation and experience. Dr. Bantock must be named among the most prominent surgeons in gynecological work, for his art of operating he must always be named among the most amiable gynecologists of Great Britain of the "Victorian age." I hope you will let me know what you have done in honor of dear Dr. Bantock. Then let me know too, please, what you are doing, dear doctor Stone, and believe me to be yours,

Sincerely and friendly,
A. MARTIN.

BERLIN, *August*, 1909.

MUNICHEN, SEPT. 22, 1909.

UNGERERSIRASSE 66 I

DEAR SIR AND COLLEAGUE:

Allow me to answer the following to your friendly letter of the September 12:

The use of the spray in operations has been in entire disuse in Germany for more than 25 years.

Listerism is so greatly modified and corrected that scarcely anything of it remains.

I give you my permission to publish this my statement and remain,

With especial respect,
Very sincerely yours,
T. V. WINCKEL.

[TRANSLATION.]

VARICOCELE IN THE FEMALE.*

BY

O. HOFMANN, M. D.,

Assistant to Chair of Surgery, Kansas City Post-Graduate Medical School; Visiting Assistant Surgeon, Kansas City General Hospital,
Kansas City, Mo.

BEFORE entering upon the topic under consideration a brief description of the anatomy of the ovarian veins will not be out of place. The veins which correspond to the spermatics in the male take their origin from the veins which issue at the hilum of the ovary and are also connected by wide anastomoses with the veins of the fundus of the uterus. They form a close plexus, viz., the plexus pampiniformis which accompanies the ovarian artery between the two layers of the broad ligament parallel with the Fallopian tube, receiving branches from the latter structures and from the round ligament of the uterus. Leaving the broad ligament with the ovarian artery they ascend along that vessel, the number of trunks becoming reduced to two and eventually to

* Read before the Jackson County Medical Society, May 10, 1910.

one, and they open above in the same manner as the spermatic veins do in the male, the right one into the inferior vena cava and the left one at almost a right angle into the left renal vein. They possess no valves.

Etiology.—The literature is rather scanty on the etiology of varicocele of the pampiniform plexus which alone is a criterion of the minor attention that has heretofore been given to this pathological condition in the female pelvis.

A preexistent puerperal sepsis (phlebitis) is to be considered as a factor, other predisposing factors are retroversion of the uterus, pelvic tumors, uterine and ovarian, pyosalpinx, hydrosalpinx, fibroids or a parametritis. From my own observations I consider as a prime etiological factor an ungratified sexual desire, viz., sexual intercourse without orgasm. This is especially so in women who have borne children or those who have been gravid and have aborted.

Age.—The origin of this condition is most commonly found between the ages of twenty and thirty years.

Social State.—More often in the young married who have been pregnant than in the nulliparous. This is accounted for by the change in the blood-vessels during the gravid state of the uterus.

Pathology.—The veins are enlarged, sometimes to the size of the little finger and tortuous, there may be a thrombophlebitis.

The more frequent varicosities on the left side are accounted for by the mechanical disadvantage in the termination of the left ovarian vein, viz., at right angles to the left renal vein into said vessel, while the right empties obliquely into the vena cava. Another contributing cause may be the relation of the sigmoid to the left vein.

Diagnosis.—That the diagnosis is by no means easy and that it is uncertain is manifested by the erroneous treatment so often instituted, that of curettage. The symptoms to the causal observer may seem vague and indefinite; and yet, if nothing is overlooked, a careful and painstaking history is obtained, and a thorough, skillful examination made, I venture to say that our errors in diagnosis will become minimized.

The patient's menstrual history is to be traced from the first catamenia, all irregularities noted and considered as to their bearing on the existing condition. The character of the pain, the time of occurrence, especially the appearance and disappearance during postural changes, is a great diagnostic aid upon which considerable stress must be placed.

Another factor in the history is that of the patient's sexual life. The false modesty that prevails among many gynecologists prevents them from delving into a woman's most closely guarded secret, namely the state of her sexual relations. There is no difficulty encountered in eliciting the true state of affairs if sought for with some tact and in the right manner. If that is obtained it will be one more link formed in the chain of evidence which leads to our diagnosis.

In quite a large percentage of my cases there existed an ungratified sexual desire extending over a variable period of time. By ungratified sexual desire I mean intercourse without orgasm. I deem it superfluous to mention the pathology of this latter condition.

Symptoms.—Pain of a dull aching character in the pelvis and frequently extending upward to the costovertebral angle on the side corresponding to the varicocele if unilateral. The same holds true on both sides if the condition be bilateral. Pain gradually diminished or complete disappearance of same if the patient is in the recumbent state, to reappear gradually when standing for a short period of time.

The most important and if obtained a pathognomonic sign is the detection of the enlarged veins by rectal or vaginal palpation. This is difficult but well worth the time and exertion spent. The patient is first placed in the Trendelenburg position and kept there for a short space of time, then allowed to come into the horizontal dorsal position with the limbs in the correct position for a vaginal examination. The tubes and ovaries are then sought for and palpated if possible, the condition closely noted. The patient is then made to stand in the erect position and while in that posture another vaginal examination is made. If now there is an appreciable increase in the size or if we no longer are able to outline the tube and ovary as in the previous examination as two separate parts we feel assured that there is a filling of the veins which will impart the sensation to the examining finger as that of an enlarged tube.

The detection of a worm-like mass I have never been able to do, and I believe it to be an exceedingly acute touch that can elicit such. I feel content to make my diagnosis on a previous outlining of the tube followed by an indefinite enlargement on postural change as described above.

The palpation per rectum as recommended is valuable when the patient is in the horizontal-dorsal position, but of no value

in the erect state in as much as the palpation is greatly interfered with and not accurate.

In by far the majority of cases we have a menorrhagia which has existed for some time and gradually increased in amount. This one symptom is the one for which so many unsuccessful curetments are done. Patients are curetted without any appreciable benefit therefrom and within a few months perhaps another curettage is done with the same result. Finally, another gynecologist will do an exploratory laparotomy and not until then is the true state of affairs apparent; the veins are excised and the woman gets well, but not before she has been unnecessarily subjected to one or more operations with all the attendant dangers.

Summing up we have first, subjectively, the disappearance or amelioration of pain when patient is in the recumbent position, and second, objectively, a palpable mass when in the erect position where none or only a slight abnormality could be detected while in the recumbent state.

Treatment.—This is essentially surgical. A long continued rest in bed with hypodermic injections of ergot might be beneficial but at its best will not be permanent and therefore is not to be commended.

The promiscuous curettage for menorrhagia, the oftentimes repeated curetments for the same condition without any beneficial nor permanent result, are surely to be condemned. We as gynecologists should be very reticent to subject our patients to a curettage (a minor procedure as some unthinkingly class it) when a patient presents herself to us with a history of excessive menstrual flow. Menorrhagia *per se* is but an expression of some existing pathological condition—retained fetal products, an endometritis, submucous fibroid, myomata or some such condition—but it is by no means uncommon to have the pathology somewhat remote from the reach of the curet. This one condition is varicocele of the pampiniform plexus of veins.

The surgical treatment consists in excision of the plexus. The patient is prepared for abdominal section according to the operator's preference, a median incision is made which should extend as low down to the symphysis as possible, for the low incision facilitates a wider and readier exposure of the operative field.

The mass is gently elevated by grasping one layer of the broad

ligament with two hemostats. This layer is then incised, care being taken not to injure the underlying veins. Through this incision with the finger, the handle of the scalpel or a hemostat the veins are freed from their ligamentous attachments. When separated they are ligated at two places as far apart as possible, care being taken to avoid the artery. After ligating, the plexus is excised and the incision in the broad ligament closed with a continuous Lembert suture. If it is not practical to dissect out the plexus it may be ligated at two points, the ligatures passing through both layers of the broad ligament and the whole mass then excised by an oval incision. The rent is then stitched with a continuous through-and-through suture and the suture line covered both anteriorly and posteriorly by Lembert sutures, whereby all raw surfaces will be completely covered.

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407 ARGYLE BUILDING.

HEART DISEASE IN PREGNANCY AND THE PUERPERIUM.*

REPORT OF CASES.

BY

J. F. MORAN, M. D.,

Washington, D. C.

HEART disease though a comparatively infrequent complication of pregnancy and the puerperium is at the same time an exceedingly dangerous one, and, in many instances, fully as grave as placenta previa or eclampsia. Yet, while the latter have been exhaustively treated in text-books and elsewhere, cardiac disease in pregnancy has by no means received the careful study and consideration which its importance deserves. For this reason, and, the further fact, that many cases of compensated cardiac lesions go through pregnancy and labor undetected, the statistical reports as to its frequency and mortality vary within wide limits and are, therefore, of only relative value.

*Read before the Washington Obstetrical and Gynecological Society, Dec. 17, 1909.

For instance, Fellner (Peterson's Obstetrics, p. 358), who has made a most careful study of the relation of heart lesions to gestation, believes that only in about 14 per cent. of the cases is the presence of heart failure recognized, while in probably 86 per cent. this complication is overlooked, because the cardiac symptoms do not become manifest. Leyden claims that about 40 per cent. of women with heart lesions meet their death in connection with childbirth and, according to Cameron, hospital statistics show that organic heart disease exists in pregnancy in 1 to 2 per cent.

Clinical experience demonstrates that the cardiopaths are not usually sterile, that they are not especially liable to abort, and that the majority of them may bear living children, particularly in their first pregnancy.

The previously accepted teaching of the French school that the heart undergoes hypertrophy during pregnancy was attacked by Gerhardt in 1862, and his findings were subsequently supported by Stengel, Stanton, and others. These authorities showed that the apparent hypertrophy was in reality due to the upward and outward displacement of the heart because of the upward arching of the diaphragm by the enlarging uterus, and, further, by the retraction of the lung, whereby the larger part of the heart surface is brought in proximity to the chest wall.

The writer believes that it is quite possible that varying degrees of temporary dilatation of the heart takes place in pregnancy similar to that which occurs after great exertion, so that the cardiac mechanism is capable of maintaining the circulatory equilibrium without undergoing appreciable hypertrophy or increasing markedly the blood pressure.

Normal pregnancy does not predispose to the development of inflammatory or degenerative changes in the heart muscle or endometrium, nor is the pulse rate or tension markedly altered. Systolic heart murmurs heard at times in pregnant women are not due to organic lesions, but are identical with those observed in chlorotic and anemic patients, or produced by slight compression of the heart. Anomalies in pulse rate, as arrhythmia or tachycardia, are as a rule only nervous manifestations. Bearing on this point I have recently delivered two women who have inorganic heart murmurs with disturbance of rhythm; both are of very nervous temperaments and anemic.

Etiology.—Heart disease may have its inception before, or during, pregnancy, or it may not occur until the puerperium.

Where it originates before pregnancy there is usually an antecedent history of rheumatism, chorea, tuberculosis, syphilis, or a specific fever; if it develops during gestation, it may be due to one of the afore-mentioned causes, or be the result of a toxemia, while puerperal endocarditis is almost invariably of septic origin.

Diagnosis.—The diagnosis of heart disease during pregnancy and the puerperium is made by the typical physical signs, but care must be exercised not to mistake a hemic murmur, with increased cardiac dullness for an organic lesion, and it should be remembered that some of the signs of heart disease may be simulated in a neurotic patient.

Prognosis.—While the prognosis of heart disease complicating pregnancy is always grave for the mother and child, the result, in a given case, will depend upon the valves affected, the amount of compensation, the condition of the heart muscle, and the general state of the patient.

The increasing demands upon nutrition, circulation and elimination incident to pregnancy, may disturb a well compensated lesion, and an uncompensated one at the time of impregnation will almost certainly lead to grave circulatory embarrassment. The injurious effect, however, is more dependent upon the condition of the heart muscle than upon the particular lesion. If there is no myocarditis and the compensation is good, the patient may pass through the pregnancy and labor without any untoward event. Mitral lesions are more frequent than those of the aortic valves, while mitral stenosis and aortic insufficiency are generally more serious. The combined existence of two or more lesions increases the gravity, and the condition of the kidneys, liver and lungs will have an important bearing upon the outcome.

It is estimated that the mortality of mitral stenosis complicating pregnancy is over 50 per cent.; aortic lesions give a mortality of 23 per cent.; mitral insufficiency is credited with 13 per cent., while in complex lesions a mortality of 50 per cent. is a conservative estimate. (Am. Text-book of Obstet., p. 238.)

Organic heart disease, by crippling the placental circulation and causing insufficient oxidation, favors the development of apoplexies in the early months of gestation and may produce abortion, while asphyxia, often fatal to mother and child, may occur toward the end of pregnancy. Such cases are particularly dangerous during the expulsive stage, on account of the efforts made by the patient, and the consequent overwork of the en-

feebled cardiac muscle. After delivery, there is an increased risk of postpartum hemorrhage and edema of the lungs. During the puerperium sudden death may take place from syncope or embolism. If this danger be happily averted, the woman, owing to diminished resistance, is still liable to acute endocarditis, should puerperal infection occur. It is readily seen, then, that pregnancy and parturition are dangerous to the cardiopath. The nature of the cardiac lesion has considerable influence upon the clinical phenomena observed; mitral insufficiency predisposes to edema and asystole; aortic insufficiency to syncope and epis-taxis; mitral stenosis to cerebral embolism, hemiplegia, and postpartum hemorrhage.

I have had seven cases of heart disease complicating pregnancy and the puerperium, five of which were seen in consultation. One had good compensation; another, fair; in four it was bad, and in one there was acute dilatation of the heart in a case of typhoid fever complicating the puerperium. Two of the mothers died; all of the infants lived.

CASE I.—*Mitral regurgitation*. Compensation fair. Mrs. O. D., age thirty; primipara; confined May 12, 1896. Labor normal, lasting about twelve hours; L. O. A. About one-half hour after expulsion of the placenta, patient complained of difficulty of breathing, the pulse quickened, edema of the lungs rapidly supervened, and patient succumbed in spite of vigorous stimulations three hours after delivery. Child living.

This case was under observation for several months before her confinement. There was a marked systolic murmur at the apex and the left border of the heart extended about 4 inches beyond the midsternal line. There was edema of the extremities and dyspnea on exertion. Urinalysis, negative.

CASE II.—*Mitral stenosis, regurgitation and dilatation*. Mrs. K., age twenty-seven; III-para. Seen in consultation with Dr. G. W. Boyd. Admitted to Columbia Hospital in labor, February 12, 1902, 10.30 A. M. Confined 11.30 A. M. This patient entered the hospital in labor; had to be delivered in a semirecumbent posture on account of orthopnea. There were double, apex murmurs, marked hypertrophy and dilatation. Urine contained albumin and casts, hyaline and granular.

Previous pregnancies and labors normal. Present labor, four and one-half hours' duration and easy; L. O. A.; child living. One hour after delivery pulse 104, and at 2 o'clock 115, and breathing labored. In spite of vigorous stimulation the pulse quickened to 150, edema of the lungs set in and the patient died at 5.15 P. M.

CASE III.—*Mitral regurgitation and aortic stenosis*. Compensation good. Mrs. R., age thirty-three; primipara. Confined

May 25, 1904. Labor normal and six hours long. R. O. A. Puerperium normal.

The patient was seen in consultation with Dr. Reisinger, who furnished the following history. Had pneumonia twenty years ago. Heart lesions detected several years before pregnancy; compensation good. Occasional attacks of syncope, and dyspnea on exertion. Very anemic. Urinalysis negative. The cardiac condition continued about same for three months after delivery, then became worse, all symptoms becoming more aggravated. Patient is now practically an invalid.

CASE IV.—*Mitral stenosis*. Compensation excellent. Mrs. M., age thirty-one; primipara. Confined July 22, 1900. Labor normal and fourteen hours in duration. Puerperium normal.

Patient is intensely nervous, anemic, and suffers from occasional rheumatic pains. About seven months after her confinement she had an attack of syncope, since which time they have recurred at intervals. Two years ago she had pneumonia attended with acute dilatation of the heart and mitral insufficiency. Present state of health is fair.

CASE V.—*Mitral insufficiency*. Compensation, very poor. Mrs. S., age thirty-five; II-para. Confined August 1, 1908. Labor normal and twenty-four hours in duration. Puerperium normal.

The patient was seen in consultation with Dr. G. W. Boyd, who furnished the following history: Had nephritis in childhood and typhoid fever eight years ago. First child born twelve years ago, labor normal but puerperium was complicated by mastitis. Had infection following an abortion five years ago. First observed the heart lesion in the third month of present pregnancy. From this time to the end of gestation had dyspnea on slight exertion, was unable to lie down or sleep, and there was marked edema of the vulva and the lower extremities. Urinalysis showed albumin, percentage not ascertained. Examination: Loud systolic murmur at apex, heart enlarged (dilated) and left border extends 4 inches beyond the mid-sternal line. Râles in lower lobes of the lungs posteriorly. Breathing labored and shallow. Pulse rapid and weak. Treatment: Rest, strychnia sulphate, infusion of digitalis, etc.

Labor tedious, otherwise uneventful. Child living and weighed 8 pounds. No anesthesia. Present condition, improved.

CASE VI.—*Mitral insufficiency and dilatation*. Compensation poor. Mrs. R., age thirty-eight; III-gravida. Seen in consultation with Dr. Kaveney, May 19, 1908. Examination: Mitral systolic murmur; heart dilated and apex displaced to the left. Edema of the lower lobes of both lungs; breathing difficult. Treatment: Advised that patient be moved to hospital, be kept in bed, diet be restricted to milk, and infusion of digitalis be given. Patient improved greatly and passed through the labor

a month later comparatively easy. No anesthetic given, but a hypodermic of strychnia was administered at the end of second stage of labor to relieve the embarrassed respiration. Infant living and weighed 6 1/2 pounds. Puerperium normal. Present state of health, good.

CASE VII.—Mrs. K., age twenty-six; primipara. Confined October 15, 1908. Labor normal. Seen in consultation with Dr. Kelley, two days after delivery. The patient was then in the prodromal period of typhoid fever. The course of the disease was stormy, complicated with acute dilatation of the heart and phlebitis of both lower extremities. The temperature reached normal for the first time on the thirtieth day, and then continued in a zigzag manner until the end of the seventh week after delivery. The phlebitis became manifest during the third week and the cardiac dilatation occurred soon afterward. The patient's condition was extremely critical for some days, but the alarming symptoms gradually yielded to the free administration of the fluid extract of digitalis, strychnia, and stimulants. The convalescence was protracted and patient has never fully recovered.

The management of the cardiopath will depend upon the degree of compensation, character and extent of the lesion, and general condition of the patient. No matter how well balanced the heart lesion may be the case should be carefully watched throughout the pregnancy, labor, and the puerperium. If compensation is completely established, our efforts should be directed toward maintaining it by safeguarding the patient against excitement, overexertion, excessive eating and exposure to cold. The skin should be kept active by a daily tepid bath. Hot baths should be interdicted for fear of producing syncope. The bowels and kidneys should be carefully regulated to relieve the circulatory system and to avert a possible toxemia. Pulmonary and renal congestion are among the most dangerous complications of heart disease, and should be guarded against by avoiding sudden chilling of the body and by the wearing of proper clothing. Moderate exercise in the open air is helpful, and the patient should rest in the recumbent posture at frequent intervals during the day. Should compensation be disturbed, as evidenced by dyspnea, cyanosis, edema of the lungs and extremities, absolute rest in bed should be enjoined, the diet restricted and heart stimulants given to meet the exigencies of the case. The judicious use of digitalis, strophanthus, nitroglycerin, nitrite of amyl, strychnia and morphia together with rest, will often restore the compensation, overcome the menacing symptoms and permit the patient to be carried safely to term or at

least to the period of viability. If, in spite of these measures, the threatening signs persist, the pregnancy should be terminated. While premature delivery affords the advantage of a small child, it must not be forgotten that it is often fraught with great danger.

Comparatively few patients succumb during pregnancy, the majority die during or after confinement. It is important then that the character of the lesion and the amount of compensation be recognized, so as to be prepared to meet the emergencies as they arise. If the compensation is adequate the conduct of the labor should be the same as in normal cases, except that it might be advisable to give a hypodermic of morphia during the expulsive stage for its quieting effect. When the circulatory equilibrium is disturbed, digitalis should be given hypodermically and its effect sustained by the administration of strychnia in the same manner. If the blood pressure is high nitroglycerin will be indicated and if this measure does not relieve the cardiac embarrassment and heart failure threatens, venesection should be performed. The abstraction of 500 to 1,000 c.c. of blood together with the careful use of digitalis and strychnia will relieve the engorged lung and overburdened heart. Venesection is particularly indicated in mitral stenosis with ruptured compensation but is serviceable in all valvular lesions under like difficulty. It may become necessary to assist the delivery by dilation of the cervix, forceps, version or a cutting operation. Whichever mode of intervention is elected, it should be carefully executed to avoid shock and sudden lowering of the blood pressure. Immediately after the delivery the latter danger should be further guarded against by placing a bag of sand on the abdomen. The placenta should be allowed to be expelled spontaneously, and no friction or kneading of the uterus practised, but free bleeding favored to relieve the disturbed circulation. Ergot must not be given. Nursing the infant should be prohibited as the patients are usually anemic. Medical and hygienic measures must be employed during the puerperium.

Regarding the advisability of marriage by the cardiopath, the writer is firmly opposed to it, for no matter how well compensated the lesion may be, pregnancy always exerts a baneful influence, exposes the patient to the danger of toxemia and dystocia, while if she passes safely through childbirth she may be left with a crippled heart for the remainder of her life. The writer is, therefore, in thorough accord with the dictum of Peter,

"no marriage for the unmarried, no pregnancy for the married, and no nursing for the confined."

The infrequency of heart disease during pregnancy, like toxemia and placenta previa, emphasizes the importance of a thorough physical examination of the patient and constant supervision during the gestation in order that the complication may be promptly detected and such measures undertaken in the interest of the mother and infant as the exigencies of the case may determine.

2426 PENNSYLVANIA AVENUE, N. W.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

JOINT MEETING OF PHILADELPHIA AND NEW YORK
SOCIETIES.

Meeting of March 8, 1910.

*The President of the New York Society, R. L. DICKINSON, M. D.,
in the Chair.*

THE PRESIDENT.—On the part of the New York Obstetrical Society its presiding officer extends greeting to our Philadelphia guests and thanks them for taking the long trip here and the longer trip home. It is a great gratification to welcome nearly thirty visitors.

A president has many privileges. His most valued perquisite is the opportunity to foist his ideas on a meeting, legislative or scientific. The inability of your chairman to recall names quickly, coupled with his hearty personal good-will, leads him to seize upon the chance to buttonhole everyone of you. Hence these modest little metal badges. It is not that we do not know all you men that are famous. It is that we may impress the to-be-famous men upon our memories, and we could hardly label you without tagging ourselves.

Seriously, I believe that the time will come when not only in conventions will each man display on the lapel his name and home, so that one does not waste time beating about the bush, but that in every hospital the house staff, the nurses, orderlies, even we of the visiting staff will go about ticketed. It certainly would make for discipline, for recognition and praise of good work, and for condemnation of bad. We would thus know the name of the new house surgeon or the substitute. We could then see the name of the special nurse, or indeed of any nurse, without the awkwardness of asking.

However, this has nothing to do with prolapsus, except that we all fall down badly on identification sometimes (laughter) and incurable rupture sometimes results.

DR. CHARLES JEWETT and DR. J. M. BALDY read papers on

UTERINE AND BLADDER PROLAPSE.*

DISCUSSION.

DR. E. E. MONTGOMERY.—It is with extreme hesitancy that I appear before you after so modest a man as has just preceded me (Baldy). From what I had heard before I left Philadelphia, I rather expected to find myself in opposition to the readers, or at least behind the present state of development of this subject, but after the very excellent presentation of the subject by Dr. Jewett and the splendid production of Dr. Baldy, I do not find that I am much out of line with these gentlemen.

I particularly agree with Dr. Baldy that it is impossible in cases of extensive prolapsus by any operative procedure to replace conditions similar to that which nature had first presented. In other words, in the relaxation which takes place, prolapsus of the vagina, rectum, and bladder, there is no operative procedure to which we can resort that will replace the natural conditions and maintain the uterus and these organs in the condition in which they were prior to the development of such a state.

Without going into the primary cause of this form of displacement, the conditions which produce prolapsus of the uterus may be described as follows: 1. The loss of support of the pelvic structures; the pelvic floor may give way and this has been emphasized especially regarding the levator ani muscle. This loss may be and most frequently is the result of labor. It may be simply a loss of muscular tone from various conditions; it may be due to a congenital condition of the bones of the pelvis, in which there is greater or less curvature of the canal. 2. The increased weight of the uterus itself; naturally we recognize that the uterus is large, whether from subinvolution or from a growth within its walls, and must tend to sag down in the pelvis; its supports become stretched, but as these stretch, the displacement downward becomes still more marked, and in this way we have the second class of conditions which enter into its production. 3. The tendency in the present-day woman is to enjoy the pleasures of the table, and, as age advances, to increase in flesh with the desire still to maintain the same waist line, not to increase the size of the corset; and the consequence is that nature, increasing the amount of adipose tissue, must dispose of it somewhere, and if it cannot take place in the waist line, it is pressed down and consequently increases the intraabdominal pressure and displacement; and particularly when combined with the weight of the uterus, decreased pelvic support, and retroversion of the uterus, the intraabdominal pressure becomes directed upon the fundus of the organ, consequently the displacement downward is very rapid and marked.

In the early stages of displacement, it is not always necessary

* See original articles, pages 1 and 9.

that operations should be resorted to. Many of these cases, particularly where we have a subinvolted uterus, the organ heavy and sagging down, the employment of a pessary will raise it to a higher level and lead to the restoration of a condition which will permit the ligaments and structures to maintain the uterus of normal size, and it is only when it is extremely large that displacement is likely to occur. Of course, in all these cases, it is necessary to advise the patient in regard to dress, the constriction of the waist line, and decreasing intraabdominal pressure. In more marked cases such as we see in the magnificent drawings lining the walls, it is necessary to resort to some operative interference. In such cases the condition is very generally associated with changes in the endometrium, so that curettage is advisable. With the increased size of the cervix, especially where it is hypertrophied, with elongation and laceration, amputation is of great value not only in reducing the size of the uterus, but in its influence on the processes of metabolism leading to reduction in its size.

As to the methods of operating upon the anterior vaginal wall, I am not so disinclined to resection as my friend, Dr. Baldy. I have been resorting to the procedure for a long time, making an incision directly through the median line to the bladder wall, then dissecting laterally a sufficient distance upon either side and cutting out a section. In some cases where there is marked protrusion and sagging down of the bladder, I have not only resorted to this procedure but have separated the bladder from the cervix and tucked up the bladder so that instead of having a protrusion pressing down upon the anterior vaginal wall, it has been supported.

I agree with Dr. Baldy that there is not much danger of retention of urine as a result of the operation, certainly not anything like the difficulty where we have a portion of the bladder which sags below the internal orifice of the urethra. The sutures of interrupted chromic catgut should be so inserted that the anterior wall of the vagina is elongated, holding up the cervix in the vault of the vagina. This operation of itself, however, will be very ineffective, as has been mentioned, unless the pelvic floor is brought forward and the lower segment made to maintain the anterior wall of the vagina. For the last six years I have been resorting to operation by splitting through the perineum, dissecting up a flap nearly to the point where the peritoneum is reflected between the rectum and vagina, and drawing into this space the levator ani muscle on either side by sutures, which include the muscle on each side and the summit of the dissection. Traction on the first sutures renders the muscle very prominent and the subsequent sutures are inserted above and below, overcoming the diastasis and establishing a firm floor against the recurrence of the hernia. The first superficial suture then is introduced, beginning at the angle of the incision, carried around the border of the flap and brought out at the opposite angle.

This tied is very like the crown suture of the Emmett operation. The remaining opened surface is sutured. The operative procedures described will not always be effective where the structures of the pelvis are completely prolapsed. The uterus is still retroverted and must be remedied by an abdominal incision. Where the woman has passed the climacteric, it is unlikely that she will have the pelvic structures distended by pregnancy; the operation suggested by Dr. Baldy may be sufficient, but in the great majority of cases I would prefer to do an operation of folding up the round ligaments, carrying a loop of each ligament through the broad ligament and securing it on the abdominal wall. This operation, in cases in which the pelvic floor is not too greatly prolapsed, will be effective, for the uterus is held forward and the intraabdominal pressure is no longer directed upon its fundus. Where the displacement has existed for a long time with marked dragging downward and projection of the peritoneum between the rectum and vagina, the operation described is still insufficient. If we had firm sacral ligaments, nothing further would be needed, but generally they are so attenuated and have so lost their muscular structure that they are difficult to discover, and any operation for shortening them must necessarily be ineffective. In these cases, instead of attempting to shorten the true sacral ligaments, I have secured the peritoneum near the promontory of the sacrum to that covering the posterior surface of the cervix and quilted the peritoneal surfaces together on either side, thus constructing a shelf which shuts off Douglas' pouch from the abdominal cavity. This procedure pulls the cervix upward and consequently tilts the fundus of the uterus forward. In some cases I have seen the peritoneum descend between the rectum and vagina until it produced a hernia at the vulva.

DR. R. C. DICKINSON, read a paper on

RECURRENCE OF CYSTOCELE AFTER OPERATION.*

DISCUSSION.

DR. GOFFE.—I seem to have been a target for some of our friends from Philadelphia, and fear that the short time allotted me will hardly afford opportunity to fittingly and convincingly reply. However, I will do the best I can under the circumstances.

Going back to the original function of the floor of the pelvis in the support of the pelvic organs, I still insist that *when the uterus and bladder are in normal position, the pelvic floor exercises no influence whatever in its support*. Now we have had the suggestion from our Philadelphia friend that Nature should be thrown to the winds; "we do not care how she does things." Still I must insist that in the evolution of organs and tissues there is always discoverable an adaptation of means to ends that cannot be ignored. Some uniform, underlying principle or law is in-

*See original article, page 17.

volved and the key to any specified process lies in discovering that general law or plan. Now Nature's plan of holding organs in place is by suspension. Take the heart, the lungs, they are suspended; they do not rest upon anything beneath them. Come down into the abdominal cavity where are the liver, the spleen, the intestines, etc. All these organs we recognize are held in place by their ligaments, the abdominal wall simply affording a restraining circumvallation. Their specific gravity does not determine their position in the abdominal cavity. We have the liver at the top and the lighter organs below.

Nature is consistent and when we examine the pelvis, the natural conclusion is that the uterus, like all the above-mentioned organs, is held up by its ligaments. When we examine the uterus we find that, weight for weight, it has more ligaments than any other organ in the body. We are told they are for guy ropes; I claim that they are to support that organ in place.

Now I know you will admit that if the perineum is torn clear through into the rectum, its supporting power entirely gone, the rule is that the uterus and bladder stay in place. Why? Not because they are held up by what is left of the perineal floor, but by their ligaments.

It is within the experience of most of you, I am very sure, that you have seen virgins with procidentia of the uterus. There is no rupture of the pelvic floor; it is as complete according to Nature's plan of making the perineum as is possible, and yet there is prolapsus. That is because the ligaments have given way, not the floor of the pelvis. Certainly if you have a house resting on a foundation and that foundation is knocked out, the house comes down, but knock out the foundation you have constructed for the uterus and still that organ stays in place, and, *per contra*, preserve that so-called support in its entirety and the uterus may still come down. I have yet to hear any one answer that argument.

Why do we repair the perineum when it is torn? If it is torn partially then the organs come down. Why? Not because the support has been taken away, but because there has been introduced a new force, not in existence before, an entirely new force that is dragging and pulling upon the uterus in the shape of a rectocele. This is explained as follows: Reaching from the posterior lip of the cervix to the anus in an S-shaped curve is a line of tissue—the vagina and rectal wall. This obtains when the tissues are *intact*. Now when the perineum is torn to the second degree, this line of tissue is forced by the rectocele to make a greater curve. After allowing for a certain amount of stretching every increase in the amount of the rectocele (the curve) necessitates the approach of the two ends of this line of tissue—and as the distal end (the anus) is forced down by straining at stool, the upper end (the curve) is the one that is dragged down. This process continues to overcome the supporting power of the ligaments until the uterus is dragged

down into the axis of the vagina, from there to the vulva, and finally out into the world in complete procidentia. When we have a tear to the second degree, it is very important, therefore, to repair the perineum; it must be repaired to save the uterus; not because the support has been taken away, but because by reason of this lesion a new force has been introduced pulling the uterus down. If it is torn clear through we have no pull on the uterus; the organs stay in place.

Now about the causes of cystocele. I believe, on the same principle, that the bladder is held up by its ligaments. One large support of the bladder is the uterus. The ligaments hold up the uterus and the uterus, in turn, supports the bladder. This is accomplished by the direct attachment of the bladder to the anterior wall of the uterus and by the firm insertion into it of the upper end of the vaginal wall. In addition to this is the fascia lata which comes down from either side, passes underneath the bladder and suspends it as in a sling or hammock. These are the two principal supports.

In cystocele two conditions obtained, viz., a descent of the upper support—the uterus—and a hernia of the base of the bladder through the vaginal sheath. In extreme conditions all of the uterus and bladder may protrude through the vulvar opening. In addition to this as described by Dr. Dickinson the various planes of tissue composing the vesicovaginal wall may slip one upon the other along the lines of cleavage and the bladder-wall slide down below its normal relative position. It is quite true, as Drs. Baldy and Montgomery have said, that it is impossible in extreme cases of procidentia to restore all the parts to an ideal normal position that shall be permanent. My contention is, however, that we should aim to accomplish that as nearly as possible. And that, I believe, is what my operation does. Let us consider for a moment the physiological action of the bladder. Howard Kelly has clearly described this as follows: As the bladder empties, the upper, more movable portion, covered with peritoneum, settles down into the lower and relatively more fixed portion, which lies in close relation to the vagina, until it comes to lie within it as one saucer rests in another. During respiration the free upper half may be seen (through the cystoscope) moving on the lower half, as if hinged, and the line of demarcation between them may be distinctly made out. At the edges where the two saucers meet, three folds are formed: the right, left, and posterior. The posterior fold stretches from side to side in front of the uterus; it is gently convex forward, following the contour of the uterus and ends in front of each broad ligament, where each lateral fold begins and extends horizontally around toward the urethra. These folds represent the physiological hinges on which the bladder moves in expanding and collapsing. The apices, where the anterior fold joins the lateral folds in front of the broad ligaments, are called the right and left vesical cornua.

The operation I have devised takes cognizance of the two distinct hemispheres of the bladder, viz., that portion below the line of hinges—the base of the bladder—which is a comparatively fixed, inelastic immobile structure, and the upper hemisphere which is covered by peritoneum and is elastic and expansile. Speaking concisely, the operation restores the base of the bladder to its normal immobile position and condition, allowing the upper hemisphere to take care of itself. This is accomplished in simple cases by dissecting the base of the bladder free from all its attachments, hanging the uterus in its normal position by shortening its ligaments and then restoring the bladder to its original position and fastening it there in such a way as to carry it up into the pelvis and restore the former line of hinges. Three chromic catgut stitches—one in the median line and one at each *cornu of the bladder*—spread out and fix the base of the bladder, after which the fascial sheath and mucous membrane of the vagina are cut out sufficiently to make the vaginal wall, when its edges are stitched together, snugly fit the base of the bladder in its new position.

In cases of extreme procidentia, especially in women at or about the child-bearing period, the uterus is removed and the broad ligaments stitched together across the pelvis, taking all the slack necessary to make them taut. Upon this newly constructed plane of tissue the bladder-wall is spread out and stitched as previously described. To this support is also attached the upper end of the vagina after its wall has been abbreviated to bring into support the fascia lata. In all cases in which a rectocele exists the perineum is repaired.

In response to Dr. Studdiford's assertion that the uterus is sustained in its normal position by the pressure of the surrounding organs, that it floats, so to speak, I wish to say: That was the old explanation when I was a student, that the uterus was held up by pressure of the surrounding structures. I have taken steps to ascertain what the specific gravity of the uterus is, and find that it is heavier than the rectum and its contents and also heavier than the bladder. Therefore, if the position depended upon the specific gravity, the uterus is the organ that would crowd the other organs up while it would be at the bottom—No, the only rational conclusion is that the uterus is supported by its ligaments.

DISCUSSION.

DR. B. C. HIRST.—What I shall say will be confined entirely to the anterior wall of the vagina and bladder. It seems to me this part of the subject is least understood and that there is more disagreement among us than about any other portion of the genital canal. There is only one way to solve this problem. In the first place, we must learn the anatomy of the anterior wall of the vagina and the supports of the bladder. Second, we must learn what damage these structures sustain in labor.

Third, we must devise some means of repairing this damage. When we learn these facts we have solved the question. How are we to learn the anatomy of the anterior vaginal wall and bladder? We are not anatomists; we must learn it from expert anatomists.

I have studied different books on the subject, including Tandler and Halban's, but, personally, I have derived most information from Waldeyer's book "Das Becken," the result of many years hard work by the foremost anatomist of the world. The only support for the lower third of the vagina and the base of the bladder, according to Waldeyer, is the muscle and fascia of the urogenital trigonum, stretching from one ischiopubic junction to the other one. There are also the uterovesical and the vesicopubic ligaments, the fascial plate derived from the fibers in the bases of the broad ligaments. The posterior vaginal wall has nothing to do with the support of the anterior wall.

The second point is, What damage is sustained by these structures in labor? We can answer this question ourselves after careful observation, with ample material extending over years and embracing cases at all periods from a few minutes to years after labor. I have come to the conclusion that the damage sustained is as follows: 1. A laceration of the urogenital trigonum muscle and fascia in the anterior sulci, which is as frequently torn as the levator ani is in the posterior sulci. 2. An elongation of the uterovesical and vesicopubic ligaments. 3. A lateral separation of the fibers of the fascial plate between the vagina and the bladder. Another conviction from my observation, clinically, is that the posterior vaginal wall has nothing to do with the support of the anterior wall. Each portion of the genital canal has its own anatomical supports.

Finally, we must devise as surgeons some means for correcting this damage. First, I would urge the prompt repair of the fibers of the urogenital muscle and fascia. That can be done easily in the first week of puerperal convalescence. I believe if this structure is repaired the first and most important provocation to formation of cystocele is removed. We have all seen the first manifestation of this condition shortly after labor in the dropping down and out of the lower third of the vagina, pulling the bladder after it. Then the rest of the structures above slowly follow, and in the course of years a complete cystocele results. If we repair the primary damage we can prevent a large proportion of the cystoceles that otherwise would form. After the cystocele has developed, the operation I am availing myself of at present is to split the anterior vaginal wall, making an incision around the cervix until I can expose the thick edges of the fascial plate, cutting the uterovesical ligament, bringing together the edges of these strong fascial flaps in the middle line, stitching them with a figure-of-eight stitch. The vaginal wall is united over the fascia and we have restored

the normal support of the bladder as well as it can be done by any routine plastic operation.

DISCUSSION.

DR. NORRIS.—I can add very little to this symposium. It has been very interesting to all of us. The anatomical facts help clarify the atmosphere a great deal, I think, as we all have been using one or more of these features in our operative procedures.

I have always felt that the separation of the bladder, as performed by Dr. Goffe, excepting, in most cases, the opening of the peritoneal cavity, has been a great advance in the restoration of most grades of cystocele, and always use his method to help replace the bladder to its proper level. I believe the bringing together of the fascia at the bases of the broad ligament, in front of the cervix, is another of the essential anatomical facts in these cases. For the extreme cases with their disturbed and abnormal anatomy, such as Dr. Dickinson has so profusely and beautifully illustrated, we are forced to abandon Nature's original plan of supports, which I am convinced are both suspensory from above and supporting from below (the pelvic muscles and fascia) and can only patch the case up as Dr. Baldy has said. For these extreme cases the abdominal operation with suspensions or fixations are absolutely necessary in addition to the skillful repair of the vaginal supports.

DR. CLEVELAND.—I think we can all say that this has been a grand meeting and we shall hope to have it repeated another year. I will not occupy your time more than a moment to say a few words about the various operations. We have all done these operations, some of us a great many of them. We have all had successes and failures and it is a question of results, after all, as to which operation we prefer.

The operation of Dr. Sims, referred to by Dr. Baldy, has certainly been successful in all our hands and has had a great many failures; I think the failures far exceed the successes.

When Dr. Goffe first taught me to do this operation of his, it at once attracted my attention and I have followed it with great satisfaction. I do it in all cases now where indicated, and it is indicated in nearly all cases of cystocele.

There is just one point further I would mention, that is in regard to the suture. I think the present use of chromic gut is not sufficient; forty-day catgut does not last forty days; it rarely lasts ten days, and observing that fact, I am in the habit of using a suture I can leave a much longer time, and use either silk or silkworm gut; I prefer the latter. I leave it for six weeks or two months, because if you put it in even for a long time, it is very easily removed. I believe that it is necessary to leave the suture until Nature has restored the conditions to nearly their normal state, and it will take six weeks to two months to bring the tissues back to their normal holding power.

DR. CHILD.—I would like in this connection to call attention to a review which I delivered before the New York Obstetrical Society some two years ago of operative procedures for the correction of cystocele during the past one hundred years. Beginning in the early cases with such primitive means as the application of caustic solutions to the anterior vaginal wall to produce contraction, down to the present time there has been a growing tendency toward the idea that the bladder was supported, held in place by suspension rather than by supports from beneath. Most of the later operations were designed with this idea, bearing in mind the well-known mechanical principle of it being easier to hold a body in place than to support it; therefore the various operations for holding the bladder by its ligaments.

Two years ago I operated on a nulliparous woman with prolapsus of the uterus of the third degree and retroflexion. She was subsequently delivered at full term of a normal child and on examination a few days ago I found that whereas her pelvic floor was even more relaxed than ever, evidently as a result of delivery, there had been no recurrence of the prolapse; her uterus was in normal position. The operation performed was shortening of the round and uterosacral ligaments.

In the City Hospital last week we operated upon a nulliparous woman with complete procidentia of the uterus.

I agree with Dr. Goffe in what he has said, and it is my firm conviction that the uterus and bladder are held in place by ligaments.

DR. JEWETT.—There is little I can say except by way of reiteration. I am glad to be sustained in part by Dr. Baldy, but I am not yet prepared to believe that the flap-splitting or interposition operation is iniquitous and preposterous. My results have, too many of them, been good; many of these patients are living witnesses of the value of the operation. In so far as the operation has failed I have ascribed the fault to the operator rather than the operation.

What Dr. Dickinson has said about prolapsus with strong levators sustains my contention that the prolapse is a hernia of the organs between the levators, owing to diastasis. I agree with Dr. Studdiford that the uterus floats in the pelvis, being held up by a combination of support and suspension.

DR. DAVIS, Philadelphia.—A word may be added to this very interesting discussion, from the standpoint of obstetric surgery.

In view of the many methods proposed for the cure of injuries resulting in prolapse and the unsatisfactory results of some of these operations, it might be well to avoid the occurrence of the original injury. It is of importance that the urinary bladder be completely emptied before vaginal delivery is undertaken. Observation shows that a patient under anesthesia secretes several ounces of urine, and hence the catheter should be used after anesthesia, just before delivery. The selection of suitable

cases for forceps operations and version, with extraction, is also important. In cases of disproportion there cannot fail to be some injury to the genital tract predisposing to prolapse. The proper application of the forceps to the sides of the fetal head, traction in the axis of the pelvis and the application of the forceps only when engagement is present, and molding well developed, are precautions, which, if observed, would do much to lessen such injuries.

Experience shows that vaginal delivery after symphysiotomy or pubiotomy is often accompanied by severe injury to the genital tract, especially in the anterior segment of the pelvic floor. Lacerations occur and the submucous and connective tissues are often torn and dislodged from their attachment to the pubes.

After vaginal delivery it is of importance that lacerations in the anterior vaginal wall and anterior segment of the pelvic floor be immediately closed. This has been my practice for a considerable time, and I have seen no case in which prompt union did not occur. In version and extraction the operator must avoid undue haste in delivery, for the hasty extraction of the child through an undilated cervix may produce lacerations extending into the vaginal tissues. The skillful performance of craniotomy will also avoid the production of such serious injuries.

Experience shows that there is a considerable number of cases where vaginal delivery is attended with such injury that delivery through the abdomen should be performed. Contracted pelvis and central placenta previa are conditions in which vaginal delivery may be far more dangerous than delivery by abdominal section.

As obstetric surgery is brought to the same plane of efficiency which now characterizes general surgery, these operations for the relief of prolapse, about which we know so much and agree so little, will be less frequently performed, because the necessity for them will be greatly lessened.

DR. GOFFE.—I would like to ask Dr. Davis what would happen in case the catheter was not passed and the urine was left in the bladder?

DR. DAVIS.—I have had but little observation of this condition, because it is my rule to have the bladder thoroughly emptied by catheter under complete anesthesia just before operating. I believe, however, that in such a condition the bladder would be pushed downward, subjected to pressure between the head and the pubes, and that serious damage to the bladder and its sustaining tissues would result.

DR. BALDY.—It seems almost superfluous to say more, in fact not much more can be added.

After seeing New York drift away from such a sound operation as the Emmet perineum, I am not surprised to see it drift away from anything; and, of course, Sims' work goes for nothing.

Anybody will judge from results, and the operation yielding best results will be the favorite of that operator.

I do not believe anyone would get good permanent results from the original Sims' oval unmodified. I use certain modifications indicated in my paper which involve the principles of both Sims' and Emmet's work on the cystocele, and would be willing to guarantee the result in a moderate cystocele. I know this method will secure the desired result. It may be that there are others—"there are many roads that lead to Rome."

I have secured perfectly satisfactory results from this method since 1888; the fact that most of you have turned from the methods you had been using during this period a number of times is proof that there is something wrong with your methods; perhaps, as in the Emmet perineum, you never learned properly to do this operation. Dr. Goffe says that he would like to know why the uterus stays up in a complete tear of the sphincter muscle and that no one has ever answered him that question. I have not before this heard him ask this question. I had thought it had been answered for all time years ago. I will tell him why.

It is generally true in a complete tear of the perineum that there is no prolapse. We all of us see patients who are sent to us with so-called hemorrhoids with the posterior wall well up against the anterior wall, giving normal support and no signs of prolapsus. We have recognized many of these cases as complete tears of the perineum involving the sphincter ani muscle. The reason many of you gentlemen do not understand this is that you do not seem to realize what is the absolute anatomical fact, viz., the levator ani muscles do not unite together over the walls of the vagina and rectum; they unite not by a direct union of the muscular fibers, but by aponeurotic extensions. If you unite them as many of you do in your operations you go contrary to nature. These sphincter tears are directly in the median line and do not touch the muscles, and therefore there is no loss of support and consequently no prolapse. There is no true perineal tear in that there is no tear of the levator ani muscles; the tear is one of the aponeurosis and at that only at one point, leaving the broad attachment of the aponeurosis intact on both halves of the severed vagina. This explains fully the conditions which result.

Coming back to the stretching of the anterior wall, get away from the word "tear," for there is no tear of the fascia because there is no fascia to tear. The bladder does not protrude through any rupture as there is no rupture. The cystocele is caused principally not only by the stretching but by the descent of the uterus, etc., and any operation which does not take their descent into consideration is hopelessly faulty.

DR. HIRST.—I think we should all get the best book on anatomy that we can find, the very best one, and devote some time to the earnest study of anatomy. (Laughter and applause.)

DR. DAVIS, President of the Philadelphia Society.—The Philadelphia Obstetrical Society extends its heartfelt thanks to

the New York Obstetrical Society for its delightful hospitality and the scientific interest of this meeting. We bring to you on this occasion our earnest study of the question proposed, and our warmest friendship.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

(Continued from June.)

A METHOD OF ANASTOMOTIC REPAIR OF THE URETER.

DR. MALCOLM McLEAN, New York, read a paper on this subject, which will be published in this JOURNAL.

DISCUSSION.

DR. E. E. MONTGOMERY, of Philadelphia, said the Fellows were indebted to Dr. McLean for suggesting an ingenious procedure for meeting an accident which occurred oftentimes in spite of every precaution that might be taken. Of course, it obliged the operator to be prepared in advance for the condition which might take place, and it might occur when it was not expected. He had seen several cases in which it would have been a great satisfaction to have had the opportunity to employ the method suggested. In cases in which the upper end of the ureter was short, or in which its severance had taken place, it made it difficult to bring the ureter down or the bladder up to the proper position to relieve the parts from tension. He had in two or three instances been obliged to raise the bladder and anchor it to the side of the pelvis in order that it might be sufficiently long to bring the ureter in contact with it. He agreed with the author as to the inadvisability of implanting the ureter into the rectum or intestine, as the patient was almost sure to have infection extending up into the pelvis of the kidney and giving trouble there which could be readily avoided by the adoption of the ingenious plan suggested by the essayist.

DR. FRANKLIN H. MARTIN, of Chicago, said he had used the catheter in one case for transplanting the ureters of an exstrophied bladder in the lower portion of the rectum in a boy thirteen years of age. He passed the ureteral catheters into the two ureters in the exposed bladder between the pubes, made an opening through the bladder into the rectum, grasped the ureters on either side with forceps, the ureters containing catheters, drew them into the rectum, and secured them at that point. In this particular case one ureter remained in the rectum; the boy discharged urine from the rectum from that time on until he lost track of the case, and so far as he knew there was no infection of the kidney. The other ureter pulled out, and the operation was not a success, and the urine still poured over the patient's body. He had used catheters for

anastomosis between ureters in animals, and made a number of experiments several years ago at the same time that Dr. Peterson was experimenting along the same line, and he believed the catheter was a valuable means of success for this sort of work.

DR. LEROY BROWN, of New York, said that several years ago in doing a vaginal hysterectomy he injured the ureter, and the ureter was pulled down at the time the injury was done. He then opened the abdomen, and resorted to the operation described by Dr. McLean. While the catheter was in the ureter the urine came through either end apparently with success. At the end of the third or fourth day after the catheter was withdrawn, failure was evident. The urine escaped through the vagina, so that it was necessary to do a subsequent operation.

DR. E. W. CUSHING, of Boston, stated that if he understood this operation, it was something similar to that described by Van Hook, or in which the Van Hook operation was not suitable. The great advantage of the Van Hook operation was not that the end-to-end anastomosis of the ureter could not be made successfully, but it was sure to make contraction afterward, and shut off the kidney. Van Hook passed the upper extremity of the ureter into the lower which would never shut off the kidney, and as far as the catheter being tolerated in the ureter was concerned, he knew this could be done. Away back in 1890, when he had three cases, which he reported and published, there were fistulæ of the ureter opening into the top of the vagina after the removal of the uterus per vagina, and in these cases he made a hole, according to his light in those days, at the extreme upper end of the bladder, passed a catheter through the bladder on up into the ureter, and by a plastic operation covered over a little space at the junction of the bladder and this fistula, and the catheter was well tolerated in the ureter for eight or ten days, and he obtained a good result. He had the opportunity of seeing the autopsy made on one of these case some eight or ten years afterward, the patient having died of pneumonia, and it was found that gradual contraction had taken place, shutting off the kidney, so that the kidney was a cyst full of clear fluid. The woman had never known it, thought she was cured, yet she had lost this kidney by contraction, and he thought this condition was likely to happen after the operation of Dr. McLean.

DR. J. WESLEY BOVEE, of Washington, D. C., did not know whether this method differed materially in any way from the plan the French had been using for the last fifteen years, and which was known as the *catheter a demeure* in operating on the ureters, and especially after ureteral cystotomy. It did differ from the ingenious device of Dr. Kelly, which he presented to the American Medical Association five years ago, which consisted of a little instrument that made a little slit in the ureter a short distance from where the splice was to be. The ends were sutured together end to end. He did not know whether or not it lessened the trouble which might ensue in the way of

tension upon the separated ends of the ureter during the process of healing while the catheters were in place. He thought there might be trouble regarding the separation of the sutured ends on removal of the catheters. He also did not think that Van Hook's method was by any means the only one or the best method of suturing. There was no question in his mind but what end-to-end anastomosis was the best anastomosis we had for the divided ureter. There might be such trouble as Emmet had in his cases in which he had difficulty in drawing the large upper end into the small lower end of the divided ureter, but in the end-to-end anastomosis we could avoid this largely by using the oblique method, as it made a little bend in the ureter. But bends were common in the ureters. He had never seen any trouble in suturing the ureteral ends together, and he had done it a number of times, and the danger of leakage afterward was a small matter. He did not think ureteroureteral anastomosis done with intelligent suturing, with a reasonably small degree of tension on the sutures, would result in a leakage, or at least in a leakage of any moment. The leakage would soon stop. It might go on for a day or two, but in most cases if the suturing was done right there would be little or no leakage.

DR. C. C. FREDERICK, of Buffalo, New York, reported the end-results of a case of end-to-end anastomosis of the ureter on which he operated a good many years ago. During the past twelve months he saw the results at autopsy upon his patient. He had removed a large fibroid tumor about fifteen years ago from a woman, and in its removal cut out about two inches of the right ureter. He made an end-to-end anastomosis, which leaked for about two weeks, then closed, and the patient was apparently well for many years. She removed to another city, and during the past year died after a long illness in which the right kidney was involved. An autopsy was made, and he saw the result of it. There was stenosis at the point of anastomosis, dilatation of the ureter above the anastomotic point to the size of a thumb, sacculated all the way up, with hydronephrosis. The kidney was as large as an infant's head, thinned out, and degenerated as the result of the stenosis at the point of original anastomosis. He thought the end-results of ureteral anastomosis ought to be reported in every possible instance.

DR. LEWIS S. MCMURTRY, of Louisville, said that almost every fellow of the society had personally met with injury of the ureter in the course of pelvic operations. When this accident occurred the operator ought not to be very greatly abashed because of the serious injury to the viscera in the course of pelvic operations, as this was one of the injuries that was most hopeful under good surgical management. In the earlier surgical work, when tumors were allowed to grow much larger than now, injuries of the ureter were much more common than at present, and passed unrecognized, with death of the patients probably as the result of it. During the past winter in his clinical service, after

enucleating pus tubes, with ovarian abscess, the case being of very long standing, in placing the patient in the Trendelenburg position to inspect the oozing points in the floor of the pelvis he discovered pus at the distal end of the ureter hanging over the edge of the uterus. The peritoneum has been injured in the enucleation at various places, and he did an anastomosis in the simplest way. It was very easy to pick up the proximal end of the ureter which he saw lying in this bed of areolar tissue and to bring it together, and he did the anastomosis in the most simple way, very much like the method Dr. Bovée had described. He invaginated the proximal end into the vesical end of the ureter with two catgut stitches, and as the patient was not in a condition to bear a prolonged operation, after placing a cigarette drain down to that point he closed the abdomen. There was leaking for three days, but this was not serious. Extensive leakage of healthy urine was not a serious matter because the fluid found its way out if there was a drainage track to provide for it. It did not disturb the patient's convalescence, and she went on to a recovery.

He did not think it was so important as to the particular method to be adopted in making the anastomosis, whether it was the ingenious method of Dr. McLean, the Van Hook method, the method of Dr. Bovée, or the simple method of end-to-end anastomosis. The result tended to be good. In case there was a great deal of structural loss of the ureter, we were left in dire straits when it came to implanting the ureter into the intestine, and the preferable operation would be to remove the kidney. To repeat, it was not so important which one of the operations was selected if the anastomosis was done well. If there was not much of the ureter lost the operation would be a success.

DR. MCLEAN, in closing, said this particular method which he had suggested was to meet those cases where invagination was not easy, and where implantation in the bladder was not practical. He had outlined one case where this could not have been done, and yet where the ends of the ureter could have been brought into apposition. He was not aware that Dr. Broun had done the operation, nor had he seen any reference to it in the literature.

THE USE OF THE INTRAUTERINE STEM.

DR. FRANCIS H. DAVENPORT, of Boston, said that twenty years' employment of the stem had convinced him of its efficacy and safety. The principal use was in dysmenorrhea of a particular type, which was characterized by severe pain coming on with, or soon after, the appearance of the flow, and rarely lasting more than twenty-four hours. The pathological condition in these cases was generally as follows: A rather small, usually anteflexed uterus, a relative stenosis of the internal os, a tendency to the formation of connective tissue at this point, and

exquisite sensitiveness to the passage of the probe. The attempt of the uterus to get rid of the menstrual blood past an extremely sensitive, somewhat narrow os, gave rise to pain until the general relaxation of the tissues which accompanied menstruation had taken place, which was usually within twenty-four hours. A solid, hard rubber stem was sewn into the uterus and allowed to remain from four to six weeks, usually with complete relief of the dysmenorrhea. The stem was also useful in some cases of sterility and amenorrhea from lack of development.

DISCUSSION.

DR. HERMAN J. BOLDT, of New York, said that constriction at the internal os in these cases could be overcome by incising the cervix, and there was absolutely no risk, so far as the surgical intervention was concerned, provided the operator took the precautions which were at the present time required. Moreover, by incising the cervix we at once and permanently overcame all danger of subsequent contraction which was always present if we used the intrauterine stem, or if we simply dilated. So far as dilatation of the cervical canal in the office was concerned, he did not think it was necessary to make any comments on it. At any rate, it was an undesirable procedure. He had seen a number of cases in which there was very decided pelvic inflammation caused by the wearing of the intrauterine stem not only in his practice, but in the practice of others.

DR. WILLIS E. FORD, Utica, New York, said that he had an opportunity immediately after returning home from the last meeting of the society of doing the operation described by Pozzi for cases of sterility in a young woman who had been married seven years. She had a small uterus, with a small cervix, and a circular pinhole os. He did this operation, cutting high and dilating the internal os in the manner described by Pozzi, bringing the mucous membrane of the canal and mucous membrane of the vaginal side carefully together with fine catgut, and was so impressed with the results that he would not hesitate to do this operation on similar cases in the future, as very soon afterward the woman menstruated with perfect ease for the first time in her life, and she had conceived within six weeks and had been delivered. Delivery was very easily effected. He had done twenty or more of these operations since it was described and with two exceptions there has been relief from menstrual pain. Within the past month he had received two letters to the effect that there had been pain during menstruation after this operation. The others had menstruated easily since and without any pain.

DR. EDWIN B. CRAGIN, of New York, stated that no operation in gynecology had given him as much satisfaction as the combination of dilatation and the introduction of the stem for the purpose of overcoming dysmenorrhea and sterility. In regard to the use of the stem, it is important that it be absolutely sterile

before its introduction. Therefore it should be boiled and used after it is taken from the sterilizer. As to whether dilatation alone suffices, he had now under his care a woman, four months pregnant, who had been previously dilated without the use of the stem, and two years later, that is, last December, he dilated and introduced the stem, and she became pregnant immediately following the next menstruation. He believed it was a procedure which relieved dysmenorrhea in a large percentage of the cases, and enabled a number of woman to become pregnant.

DR. CHARLES M. GREEN, of Boston, said that his experience with the use of the stem tallied with that of Dr. Davenport. He should say, as Dr. Cragin had said, that a large proportion of the cases of dysmenorrhea were relieved, and generally permanently relieved. It was known that the canal would contract after a time, sometimes after three or four years, but in the married woman this was prevented by the ensuing pregnancy. He had had many cases of successful treatment of sterility by this method. The technic he employed was slightly different, in that he did not allow a patient out of bed with an intrauterine stem. He kept in the stem from ten days to two weeks. He used a glass stem.

DR. LEROY BROWN, of New York, said since his attention was called two or three years ago to the Davenport stem he had gotten better results from its use than from any other previous method. The stem as suggested by Dr. Davenport was solid, and it was a little smaller than the small finger or about the size of the small finger. In that lay largely the value of it, in addition to drainage, etc.

DR. CLEMENT CLEVELAND, of New York, said that as a pupil of Sims' in the early days he followed his method with varying results, always with fear, being aware that Sims lost cases. But this was in the days before thorough asepsis was practised. When Dudley published his articles on anteflexion and its relief, he took up his operation and followed it with good results in over 300 cases. When Dr. Davenport told him of the stem he had devised for this purpose, he hesitated about using it for fear of serious results which might come from its use, but his timidity was overcome after awhile and he commenced using it. His results had been far better than after the Dudley operation, so much so that now he did not do the Dudley operation, always using the stem.

DR. GEORGE TUCKER HARRISON, of New York, was absolutely sure that the intrauterine stem did relieve the conditions mentioned, dysmenorrhea and sterility, and therefore its use was indicated in a number of these cases. He did not use the intrauterine stem as much as he formerly did, preferring other methods, but at the same time he had had enough experience with it to know that it was of great value.

DR. W. GILL WYLIE, of New York, said that if the essayist would look up a paper in Gynecology by American authors,

written by Mann, with reference to the treatment of menstrual disorders, he would find literally the statements he had made and the method he had devised, with the exception of sewing the tube to the cervix, and with this difference that there is a slit made in the side of the tube one-third of an inch, which allowed the blood to escape. Dr. Wylie had repeated the method therein described several times in cases of sterility and imperfect development of the uterus with gratifying results. There was not the slightest risk in using the hard rubber stem if it was introduced aseptically, and especially if the woman had never born children.

THE NEED FOR FURTHER DEVELOPMENT OF THE SURGERY OF THE UPPER PELVIC FLOOR BY DIRECT SUPRAPUBIC APPROACH.

DR. WILLIAM M. POLK, of New York, illustrated this subject by referring to eleven cases of operation performed between January, 1909, and April 29, 1910. One was a case of complete prolapse or procidentia. Two were cases of partial prolapse, the cervix resting at the ostium vaginæ. Five were cases of retroversion with adhesion, etc. Three were cases of retroversion without adhesions, and one a case of prolapse of the pelvic floor subsequent to hysterectomy some years prior. None of the cases was of more than a year's duration, and some of only a few months. He would withhold conclusions as to the ultimate results for some time to come.

He then spoke of the necessity of the operation and the manner of its performance. The necessity for the operation which he described he believed to be conceded by a large majority of workers in gynecological surgery. This was based on the conception of the pelvic floor as a structure of double formation, with an outer or lower floor made up of muscle and its encasing fascial coats, and an upper or its peritoneofascial structure. The accessibility of the lower floor had enabled gynecologists to restore it, while the inaccessibility of the upper had led them to indirect lines of approach, and to more or less incomplete or inadequate measures for its restoration on the one hand, or upon the other, to lend it the aid of suspension.

As to the manner of performing the operation on the upper pelvic floor from above, in cases of retroversion, it was merely a part of that already placed before the society by the essayist in a communication last year.

THE PRESIDENT'S ADDRESS: AMERICAN GYNECOLOGY.

The President, DR. EDWARD P. DAVIS, of Philadelphia, spoke on this subject. (See page 865, vol. lxi.)

TREATMENT OF ECLAMPSIA.

DR. BARTON C. HIRST, of Philadelphia, read a paper on this subject. (To be published in this JOURNAL.)

EXTRAUTERINE PREGNANCY, ELEVEN MONTHS, SAC ENUCLEATED WITHOUT RUPTURE; SPECIMEN AND X-RAY PICTURE.

DR. E. C. DUDLEY, of Chicago, said that this specimen was the product of ectopic pregnancy removed July 20, 1909, two months after term. The mass was posterior and to the left of the uterus. The incision was made in the median line. The tumor was almost universally fixed by adhesions or by continuity of development. The adhesions were intestinal, uterine, parietal, omental, and they existed between the mass and all the adjacent structures, especially to the anterior abdominal wall and the sigmoid flexure. The mass, about eleven inches in diameter, was carefully separated from its adhesions, and shelled out unruptured. The resulting raw surfaces were equal approximately to a surface not less than twelve inches square. An incision was made back of the uterus into the posterior vaginal fornix, and through this incision a continuous gauze drain was introduced from above downward into the vagina. The upper part of this drain consisted of gauze packing sufficient to fill the field of operation and to prevent oozing. This packing was then covered in by stitching together the peritoneal surfaces above it in such a way as to cut off completely the field of operation from the remaining portion of the abdominal cavity, and to cover all with normal peritoneum. This suturing across the pelvis from side to side involved extensively intestinal structures, and especially the sigmoid flexure, which was stitched to omental, parietal, bladder and other visceral peritoneum wherever possible to bring the parts together in order to quarantine the field of operation from the general peritoneum. The abdominal wound was closed without drainage and healed promptly. A slight fecal fistula subsequently discharged through the vagina, but closed spontaneously in a few days. Such very extensive enucleation of so large a mass due to ectopic pregnancy ordinarily would not be undertaken. The fact that success followed this operation did not necessarily influence the author in recommending the procedure as a routine in similar cases. He reported this method with the suggestion that it might be considered more surgical than the conventional operation or incision and drainage, but although more surgical it perhaps might with subsequent experience prove to be more dangerous.

DISCUSSION.

DR. EDWIN B. CRAGIN, of New York, had operated on four cases of ectopic gestation at full term. Two of the women were delivered of living children at the operation. In one of the four cases he was able to ligate the vessels supplying it and to enucleate the sac without rupture, but was obliged to take the uterus with it. All the patients recovered, but in only one case was he enabled to follow anything like the procedure of complete enucleation.

DR. E. E. MONTGOMERY, of Philadelphia, said that fifteen years ago he operated upon a woman who was fifteen months pregnant. The uterus was in front of the sac. After opening the abdomen it was found that the small intestines were so intimately related to the sac that it was impossible to attempt its removal. The fetus was removed, and a communication was established between the sac and the abdominal wall, and packed with iodoform gauze. Patient recovered.

DR. HERMAN J. BOLDT, of New York, had had four cases of ectopic pregnancy at or near term, and in only one was it possible to remove the sac without rupture. He lost one of the four cases.

DR. A. LAPHORN SMITH, of Montreal, had had two cases of tubal pregnancy at term. One of the women refused operation and was alive. In the other he removed the child, and when he attempted to enucleate the sac the hemorrhage was so profuse that he stopped and closed her up. The woman died in eight days from exhaustion.

DR. E. W. CUSHING, of Boston, had had one of these cases many years ago in which he waited until the child died. It seemed to him a safer thing to wait a month, which he did, and then opened the abdomen. The sac was thin. The child was found loose in the abdominal cavity, was removed, and the woman recovered.

DR. O. B. MILLER, of Washington, D. C., had a case of ectopic gestation about five years ago on which he operated, delivering a living child at term. The whole sac with the placenta was removed, and the woman recovered. The child died of hemorrhage following ligation of the cord by the nurse, to whom the baby was turned over at the time of the operation.

DR. JOSEPH TABER JOHNSON, of Washington, D. C., recalled a case of ectopic gestation which he had about ten years ago. The woman was supposed by those who saw her before he did to be twelve months pregnant. The nature of the case was not clearly understood, and at the operation doubt was expressed as to whether she was pregnant or not, but there was a large tumor at the side of the uterus, which was enucleated without breaking the sac. On opening the sac it was found to contain a full-grown fetus, weighing nine pounds. The abdomen was closed without drainage. The patient recovered.

REPORT ON VACCINE THERAPY IN GYNECOLOGY AND OBSTETRICS.

DR. J. WHITRIDGE WILLIAMS, of Baltimore, DR. EDWIN B. CRAGIN, of New York, and DR. FRANKLIN S. NEWELL, Boston, constituted the committee who made this report. The evidence at present available justified the following tentative conclusions concerning the value of vaccine therapy in gynecology and obstetrics:

1. Opsonins undoubtedly play a part in the production of active immunity. On the other hand, the determination of the opsonic index is technically very difficult, and is subject to such variations that it is not available as a diagnostic or prognostic guide, and even among trained bacteriologists there is considerable skepticism as to its practical value.

2. Immunization by means of vaccines is a well-established prophylactic measure against certain infectious diseases, notably typhoid, cholera, plague, and dysentery. Vaccine therapy is undoubtedly a valuable remedial agent in local infections due to the tubercle bacillus or staphylococcus, less so in local infections due to other pathogenic bacteria, while there is considerable doubt as to its efficiency in acute general infections.

3. In chronic gonorrheal arthritis and urethritis it is a valuable adjunct to other treatment and occasionally alone may lead to cure. It appears to be useless in the acute infections, while it is more efficient in the treatment of the vulvovaginitis of children than any other means, but even here it does not always result in cure.

4. In infections of the urinary tract, especially those due to the colon bacillus, it sometimes results in symptomatic cure, but rarely relieves the bacteriuria. The scanty reports concerning the pyelitis and the pyelonephritis of pregnancy indicated that vaccine therapy was no more efficient than the usual treatment by rest in bed and the administration of salol or urotropin, as in neither does the bacteriuria disappear until after the termination of pregnancy.

5. In certain cases of endometritis it appears to reinforce the curative influence of curetage. The reports concerning its use in pelvic inflammatory diseases are too scanty to justify conclusions, but it would seem that it may be of value only in chronic postoperative cases with sluggish fistula formation.

6. As the ordinary localized puerperal infections, irrespective of the nature of the offending bacteria, tend to spontaneous cure, the field for vaccine therapy is practically limited to acute general infections, whereas they unfortunately appear to be of little value, and the most that can be said from the reports thus far available is that their employment does no harm.

THE USE OF VACCINES IN SEPTIC AND INFLAMMATORY CONDITIONS.

DR. E. W. CUSHING, of Boston, said the classes of cases most common in abdominal surgery and obstetrics in which vaccines were useful were puerperal infections, appendicitis, abdominal operations, infections of the bladder and kidney, and post-operative fistula. Since January, 1907, he had records of over fifty cases of the use of vaccines in cases on which he had operated or treated himself or had seen and watched in consultation. Nearly all of the cases (some 700 or more) on which he had operated during that time had required no vaccines as the

forces of nature were sufficient to insure recovery. Vaccines, nearly always autogenous, were used in fifty-three cases of infections from various types of organisms. It was only by continuous and careful observation of cases, by noting the fall in temperature, the amelioration of symptoms, the acceleration of recovery following the use of the vaccines that an appreciation of their value could be formed. In watching these cases he had been thoroughly convinced that in some of them lives were saved, and in most of the others convalescence was promoted and shortened by the use of the vaccines, which in nearly all cases were autogenous, that is, derived from the patients on whom they were used. All of the puerperal cases and all but two of the others were infected before he saw them. Of the seven which recovered, at least three were apparently likely to die, and he believed that without vaccines they would not have recovered. In two laparotomies very grave symptoms on the second day disappeared at once on the administration of mixed streptococcus and colon stock vaccines. Two cases of myomectomy died in spite of vaccines, one with a staphylococcus, and one with a streptococcus infection. There were also two fatal cases of appendectomy in the presence of general peritonitis; one fatal case of streptococcus phlegmon of the deep tissues of the neck, with septic pneumonia; one fatal case of chronic pyemia with pneumonia. It was thus clear that in vaccines we have no panacea, no cure-all, but merely a valuable addition to our therapeutic resources. On the other hand, in none of these cases which he had watched, and in no others of which he had any knowledge, had any bad symptoms followed the use of vaccines, nor had any harm been done to the patient by their administration.

The results of his experience were summed up as follows: Vaccines were useful in all cases of infection. They were indispensable in cases in which the natural forces failed to overcome the infection. They would turn the prognosis from bad to good in many doubtful cases. They would not work miracles nor render unnecessary the use of other approved methods of treatment, and the application of general surgical principles. In order to obtain good results skilled knowledge and zeal on the part of hospital assistants and internes were requisite. In this respect he had been singularly fortunate.

THE SURGICAL TREATMENT OF PUERPERAL SEPTIC INFECTION.

DR. E. E. MONTGOMERY, of Philadelphia, stated that the most effective safeguard against the baneful influences of sepsis was the practice of such measures during the parturition and puerperium as would lessen the opportunities for its production, but such measures did not properly enter into this discussion, for their careful practice would obviate the necessity for any consideration of surgical measures. The suspicion of sepsis confirmed, the course of the surgeon must very often still be a tentative one and largely

dependent on the period at which the patient came under observation. Rarely after the diagnosis was definitely determined was it worth while to resort to the use of the curet. The infective germs very rapidly passed beyond the superficial structures, so that the procedure of curetting was ineffective to limit the progress. The entire removal of the uterus would not always be adequate, so operative procedure should be delayed until it was evident there existed such a localization as shall make operation effectual in arresting further baneful progress. The results of serum therapy were not always so satisfactory, as not infrequently its employment had been begun too late, or the virulence of the infection was so marked that the best result to be obtained would be a local manifestation of the poison which would still require resort to the knife for the safety of the patient. A case was cited in point. Extensive peritoneal exudate entirely surrounding the uterus and fixing it and the appendages might be entirely absorbed and the patient restored with functioning organs by rest, regulation of the diet, moderate depletion, and the judicious use of improvised carbonic acid baths. The constant course of the surgeon should be one of watchfulness, utilizing every force at his command to conserve the functions of the patient, yet to proceed unhesitatingly to the most radical measures when such seemed necessary to preserve life.

WHEN SHALL WE OPERATE IN PUERPERAL SEPSIS?

DR. JOHN OSBORN POLAK, of Brooklyn, New York, read a paper with this title, which was based on a study of two hundred consecutive cases, in which he drew the following conclusions:

1. That each case of postpartum or postabortal infection must be studied individually, and an accurate diagnosis must be made on the clinical, bacteriological, and blood findings before any treatment is instituted.

2. Nature is competent in the majority of instances to localize and circumscribe the infection.

3. Curetage, douches, and examination during the acute stage break down barriers and open avenues for the further dissemination of sepsis to the myometrium, parametrium, and adjacent tissues, and the danger from curetage increases with each month of pregnancy.

4. Enormous pelvic and abdominal exudates may disappear without operation, and in time enlarged ovaries, tubes, etc., may assume their proper size and function, and further, as long as the patient's general condition improves, no surgery is advisable.

5. All operations are attended with less risk after the acute stage of the infection has subsided, and an exact diagnosis is more easily made at this time.

6. After the uterus is thoroughly emptied, the pelvis should be

left absolutely alone, and we should make every effort to support the patient and increase her natural blood resistance.

7. Extraperitoneal drainage of local foci should be elected when possible, either by incision just above Poupart's ligament, or by posterior vaginal section, and when this is impossible, because of an inability to determine the exact anatomical relations of the local foci, an exploratory laparotomy is justifiable in order to make an exact diagnosis, and determine upon the safest route for drainage.

8. Operative interference in the acute stage of sepsis is only indicated in general purulent peritonitis, postabortal pelvic peritonitis, infected tumors in or near the genital tract, and uterine rupture, when the rupture has occurred in the course of labor, and has been handled outside of a well-managed maternity, and finally that thrombophlebitis is a conservative process on the part of nature to limit the infection, and that any form of pelvic manipulation only tends to break down and separate parts of these thrombi, extending the infection to the more remote parts, thus jeopardizing the patient's life.

THE SURGICAL TREATMENT OF PUERPERAL SEPTIC INFECTION.

DR. HIRAM N. VINEBERG of New York, referred to the difficulty in setting the indications for major surgical intervention for want of reliable guides, bacteriological or clinical, as to the course and prognosis of a given case.

In pure septicemia (streptococcemia), generally known as foudroyant sepsis, there was such a rapid overwhelming of the body with virulent microorganisms (streptococci or staphylococci) that little hope was to be entertained from surgical measures. The writer, however, reported a recovery from hysterectomy and ligation of the pelvic veins in a case of acute streptococcemia following an attempt at criminal abortion on the part of the patient herself.

Streptococcemia in the puerperium at term could not be recognized early enough to offer any hope from such radical measures. In acute puerperal pyemia encouraging results had been attained from ligation of the pelvic veins. The diagnosis was not usually difficult, and rested upon a great remission in the daily fever curve, with or without chills, with a pulse that was usually of good volume and only of moderate rapidity, and upon a negative finding on bimanual examination. Some writers laid great stress upon being able to palpate the affected veins as worm-like structures. The writer was unable to elicit this objective sign in any of the cases that came under his observations.

He described the technic in detail with the aid of two drawings, copies from Kownatzki's plates of the pelvic veins in the gravid and puerperal states. The method had the advantage of not robbing the woman of any organ, important or otherwise, and of being comparatively safe in the hands of an experienced operator with a fair knowledge of the pelvic vessels.

Cases of puerperal septic infection were met with that did not conform to the clear-cut groupings based on a single pathological lesion—a method of classification that was almost universally followed by writers on the subject. For example, in one of the author's cases there was a combination of lesions: streptococcic endometritis, purulent gangrenous metritis, and streptococcic thrombophlebitis. In such instances removal of the uterus alone, or ligation of the veins alone, would not be sufficient. Extirpation of the uterus and ligation of the veins would be indicated.'

The hope of improving the results heretofore obtained lay in such a course of action, combined with persistent efforts to render the clinical and bacteriological evidences more decisive so that an early diagnosis and fairly reliable prognosis might be at our command.

Hysterectomy was indicated; a, when the uterus contained putrid placental remains that could not be removed with the finger or curet; b, when the uterus contained a sloughing fibroid; c, when the uterus was studded with abscesses; d, when the uterus had been subjected to severe traumatism and gave evidences of infection. Cases belonging to each group were reported by the writer with recovery in every case operated upon.

Puerperal septic peritonitis, if seen before the patient was moribund, called for multiple incision and drainage as practised with such success by Leopold and Bumm. The procedure was simple and was not attended with any shock. If the diagnosis be in doubt, some of the peritoneal fluid might safely be withdrawn with a hypodermic needle for bacteriological examination.

Puerperal septic salpingoophoritis occasionally developed at once into the gangrenous variety and called for immediate surgical intervention. The writer reported such a case some years ago with recovery. Much more frequently the process was less virulent, and a pyosalpinx or tuboovarian abscess formed. Here delay was of advantage, for after a time the mass became encapsulated and might be reached by an extramedian incision without entering the general peritoneal cavity. For the past few years the writer, in operating for this condition, had selected an incision either parallel to and above Poupart's ligament, or along the external border of the rectus muscle. In every instance he was enabled to extirpate the tuboovarian mass without entering the general peritoneal cavity, and all the patients made good recoveries.

Puerperal pelvic exudates (peri- and parametritis) demanded the most conservative treatment. Even when there were evidences of pus it was well to wait until the mass became adherent to the abdominal parietes before incising and draining it. Of course, where the pus collection was so situated that it might be reached through the vagina one might safely intervene at an early period.

In those instances where the entire lower half of the abdomen

was filled with an enormous mass, in which it was impossible to distinguish by abdominal or bimanual palpation any of the pelvic viscera, the writer had practised multiple incisions and drained each pus focus separately.

Although the writer was an advocate of major surgical intervention in suitable cases, and although he was fairly active in hospital and private practice, he had had occasion during the past seven years to extirpate the uterus in only six cases. From this it could be inferred that it was only very rarely that major surgical intervention was indicated in acute puerperal septic infection. The vast majority of the cases got well under appropriate general treatment and such minor surgery as the exigencies of the given case might call for.

DISCUSSION.

DR. FREDERICK J. TAUSSIG, of St. Louis, Missouri, said that three months was too short a time to speak of any results from the use of vaccine treatment, but he would briefly mention his own results. They were based entirely upon work in connection with cases of chronic endocervicitis. The fact that the best results had been obtained in chronic cases, and the absence of any good form of treatment for cervical catarrh had induced him to try experimentally the use of these vaccines. He had used only the staphylococcus albus vaccine, and his experience extended over eleven cases, with seventy-three injections. The results on the whole had been fairly satisfactory in so far that in seven of these cases a very decided diminution of the discharge took place, and the remainder of the cases had not been under treatment sufficiently long to speak of results. He had started usually with injections of 100,000,000, and only gradually ran it up to the full tube containing 400,000,000, of the cocci. Whether these results would be permanent or not, of course further investigation would have to decide.

DR. HIRAM N. VINEBERG, of New York, said that Dr. Polak's results in streptococcemia had been so remarkable that he thought he owed it to himself to give exactly the method he had followed. He knew that Dr. Polak had not made these examinations himself, and a good deal depended upon the bacteriologist and who made the examinations. From the seventeen cases there were only two that died. That small mortality was remarkable in cases in which streptococci were found in the blood. He did not know of any statistics that would compare with them under that form of treatment. It was true, thrombophlebitis was a cause of death in a large number of cases. This had been clearly demonstrated in the various pathological institutes abroad, both in Hamburg and Leipzig, where out of fifty cases death in twenty-four was due to septic thrombophlebitis and nothing else.

DR. I. S. STONE, of Washington, D. C., had gotten away from the use of gauze in the peritoneum except for the suppres-

sion of hemorrhage. If drainage of the pelvic cavity was needed, why not open it up and put in large drainage tubes, well fenestrated, which will get rid of the sero-pus in some of these cases where the abdomen had been opened. The occasion must be rare for us to open the abdomen in a case of streptococcic infection. Most of these cases had died in Washington as well as elsewhere, and Dr. Polak's low mortality was very remarkable.

DR. POLAK, in closing, said that of many hundred cases of sepsis he had seen in the last two years, this series of 200 consecutive cases had been the most remarkable, and the only thing he could attribute it to was this: in regard to the cultures, they were made by a careful bacteriologist day after day in these cases. They would frequently find that in the first few weeks they would get negative cultures. It was exceptional in the first week in any of the cases to get positive cultures. There were only three cases in which within the first week they got positive streptococci in the blood. That would show one thing, that these types were not markedly of the hemorrhagic type. His own feeling about sepsis was that streptococcic invasion was frequently due to faulty manipulation and extension of the streptococcic infection; that unless the infection was extremely virulent, nature had the faculty of isolating things in the uterus and of making it practically an extrauterine affair on the inside of the uterus. He called attention to the permeability of iodine in the treatment of these acute cases when they first came in and in leaving the uterus packed with gauze saturated with iodine for a considerable time. The gauze would come out perfectly white, showing there was a limited virulence of the streptococcic infection.

In regard to thrombophlebitis, personally in this series he had not observed a single instance in which that condition had occurred of the ovarian veins. The five cases reported were instances of thrombophlebitis of the femoral veins. In these the diagnosis was readily made.

IS PUBIOTOMY A JUSTIFIABLE OPERATION?

DR. J. WHITRIDGE WILLIAMS, of Baltimore, read a paper on this subject.*

(To be concluded.)

*See original article, JOURNAL for May.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of December 17, 1909.

The President, DR. KELLEY, in the Chair.

DR. MORAN read the paper of the evening.

HEART DISEASE IN THE PUERPERIUM.*

DISCUSSION.

DR. G. BROWN MILLER opened the discussion.

Statistics of clinics in which routine examination of the heart is made show that from 1 to 2 1/2 per cent. of all pregnant women have some form of heart disease. That the great majority of women who have heart trouble do not suffer to any appreciable extent is manifest when one recalls how seldom grave symptoms arise, due to this condition. I can recall but two cases in my limited experience where a grave condition of the patient during pregnancy arose from a recognized heart lesion. Fellner, who has been quoted by the essayist, states that he recognized in 2.4 per cent. of his cases some heart lesion, but that only one-seventh of these showed cardiac manifestations. Other authors believe a larger percentage suffer from the effects of the disease. Williams states in his text-book that perhaps one or two women in 100 present heart lesions, but that in 3,000 cases of labor he has seen only one case where cardiac symptoms were alarming, and she recovered. I will not go into etiology or diagnosis.

Prognosis.—Bumm states that the prognosis for mother and child depends not so much upon the valves involved, the character of the murmur, etc., as upon the condition of the heart muscles and the state of compensation. A strongly developed and sound heart muscle which, though hypertrophy has overcome the disturbances of circulation, overcomes without especial trouble the increased work which pregnancy and parturition bring about. He says you can often see in spite of loud murmurs over the arterial or venous ostia everything pass smoothly through pregnancy and labor and the occasional disturbances be overcome by rest, diet, and the use of digitalis. It is quite otherwise in uncompensated heart disease and degenerated heart muscle. Disturbances of the circulation here may be seen early, and the condition of the mother become serious through dyspnea, edema of the legs, ascites, hydrothorax, albuminuria, and bronchitis.

The child is apt to perish, as the essayist states, by deficient oxidation of the blood, by hemorrhage of the uterus, due to the heart disease or other changes in placenta, and the premature

*See original article, page 70.

labor which results may save the life of the mother. It is generally thought that mitral stenosis in the most unfavorable of the valvular lesions, and Lusk believed that the induction of an abortion should be performed as soon as the diagnosis of this condition is made.

The essayist has carefully outlined the treatment in such cases. As he rightly says, the majority of the women who have severe heart lesions and die do so during or after labor. This very fact renders the indications of the treatment which is frequently of most avail; *i.e.*, the induction of abortion or premature labor difficult to deliver. I recall most vividly a woman who had a most pronounced heart lesion so that at the second month of pregnancy after consultation of several very competent men it was decided to bring on abortion. It was desirable not to give an anesthetic, so that the attempt was made by partial dilatation of the cervix and breaking up the ovum by a small curet. She had hemorrhage and pain and some fever, but no abortion. It was finally necessary to give ether and empty the uterus. She took the ether splendidly and then the suspicion arose in my mind whether she would not have gone through her pregnancy without serious symptoms. The induction of premature labor toward the end of pregnancy is not always easy and is by no means free from danger, so that the indications for the induction are by no means easy to determine, and one is apt to postpone it too long. The mortality (two in seven) of the essayist's patients shows how serious the effects of labor are, and even though the woman may survive the delivery, the heart conditions may be rendered much worse by going through the pregnancy and labor. One of the most serious obstacles in determining whether we should end pregnancy prematurely or not is the extreme difficulty in ascertaining the actual condition of the heart. The average obstetrician does not pretend to be an expert in heart diseases, but those who do are frequently at sea in the estimation of the seriousness of the condition, especially in pregnant women where there is more or less disturbance normally in the action of the heart.

Just why the moment of expulsion should be the critical moment for these hearts is not altogether clear. Fritsch thinks it is due to the sudden decrease in intraabdominal pressure after birth, which allows a collection of blood in the large abdominal vessels and as a consequence a sudden emptying of the heart of its blood with its resulting failure. Spegilly and others take the opposite ground, *i.e.*, that it is due to the overfilling of the right heart caused by an increase of blood in the veins due to closure of the uterine sinuses and the aspirating effect of the sudden sinking down of the diaphragm at the moment of expulsion of the fetus.

The question of pregnancy and heart disease is, as the essayist says, a very important one, and as many cases escape the attention of the careless obstetrician until there are symptoms due

to broken compensation, it emphasizes the necessity of making a careful routine general examination of all cases of pregnancy.

DR. BARTON remembered a case of mitral stenosis that died soon after labor and another case that lived several years with attacks of loss of compensation that were more frequent after labor than before and were less amenable to treatment. In the line of treatment it had been proven that the use of digitalis hypodermically was of no benefit as it was not absorbed from the skin, that the rapid action of digitalis could be obtained only by direct application to the heart which was not often justifiable. The amorphous strophanthin used hypodermically in doses of $\frac{3}{4}$ to 1 milligram was most active and effective as shown by the sphygmocardiogram, with a marked effect inside of one hour and lasting nearly twenty-four hours. The crystalline strophanthin was better than the amorphous. Strychnine had no local effect except through the central nervous system slowing the heart.

DR. STONE recalled a case where veratrum viride following morphine had magical effect. The veratrum had been expected to regulate the heart rhythm without decreasing force as seen in pneumonia.

DR. ACKER had seen two very bad cases recover after labor.

DR. ABBE asked if any extensive study had been made of the pathological heart action during labor upon which sound treatment could be based. It might well be that overactivity of the heart which was normal during pregnancy needed depression after labor and that so veratrum viride would well be indicated instead of the cardiac stimulants.

DR. THOMAS said that books on heart disease were now devoting attention to the question of heart disease in pregnancy. He considered the cases of myocarditis as more serious than the valvular diseases. Few of the total number of heart cases were fatal during labor. The simple mitral disease was serious only from the disturbance of the right heart that might be an accompaniment by back pressure. In such cases bleeding would be an effective and appropriate form of treatment. In the cases of mitral insufficiency and mitral stenosis with enlargement of the left heart bleeding did no good. He had heard of one case of the use of strophanthus with apparent resuscitation of the patient.

Meeting of January 7, 1910.

The President, DR. KELLEY, in the Chair.

DR. DUFF G. LEWIS reported a case of

TUBERCULAR INFLAMMATION OF THE FALLOPIAN TUBES.

Miss L. C., white, age twenty-four, unmarried, usual weight 100 pounds.

Previous History.—General health has always been good, though never robust. About three years ago she had typhoid

fever of a mild type. Menstruation very irregular and attended with a great deal of pain. Early last June she had planned to take a trip abroad and was visiting relatives in Kensington, Md., when she was taken with severe pain in her lower abdomen, accompanied by chill and high temperature. Dr. W. Lewis was called to see her. He kept her under observation and treatment for several days, when the patient grew rapidly worse.

I was called in consultation on the evening of June 19, last, and found a delicate young woman with a temperature of 103 degrees, pulse 100. There was great tenderness over the lower abdomen with marked rigidity of the abdominal muscles. Her lungs were apparently normal and heart sounds good.

A digital examination, forefinger in rectum, revealed the presence of a large fluctuating mass in the culdesac extending well up on each side. As the patient was undoubtedly a virgin, I was somewhat puzzled to ascribe a cause for the abscess formation.

I advised removing her to Sibley Hospital, which was done the following morning. After being in the hospital for several hours her condition grew rapidly worse and on the evening of June 20, I operated.

I found the lower peritoneum partially covered with tubercles, both tubes very much enlarged, and a pint or more of pus occupying the pelvic culdesac. I had to deal with a clear case of tuberculosis of the uterine adnexa.* I removed both tubes and one ovary. The uterus was not enlarged and appeared quite normal. Drainage was used per vagina, rubber tube and gauze. The patient was sent to her room in a fairly good condition, and in twenty-four hours her temperature had fallen to 100 and had reacted well.

A great quantity of very foul-smelling pus drained through the vagina, which continued for fifteen days. The temperature ranged from 99 to 101 up to this time, when it suddenly shot up to 103. On the ninth day I removed the stitches and the wound had healed. On the fifteenth day with the sudden elevation of temperature, the nurse called my attention to a swelling in the lower end of the incision which was a mural abscess. I incised it and drained out about 3 ounces of very foul-smelling pus. The condition in the pelvis was very satisfactory, free of any pus collection.

Her convalescence from this time on was tardy but continuous. She left the hospital at the end of the fifth week and returned to her home in Michigan. A sinus persisted in the abdominal wall and, in spite of local treatment by her family physician, it failed to heal.

She returned to Washington in October to have me dissect out the tract. Under ether I removed all the disease tissue along the tract which extended to the peritoneum, but not through it. This tract was undoubtedly infected with the germs of

* Pathological report by Dr. J. B. Nichols showed tubercles in tubes.

tuberculosis. There were two branches to the sinus. I closed these and packed the main channel with bismuth paste. About the end of four weeks she returned home well. I made a pelvic examination while she was under ether and the results were all that could be desired.

In these days when there is so much in the daily and medical press concerning tuberculosis, it is interesting to speculate on how the tubes became infected with the bacilli. Most authorities suggest that when the pelvis is the primary seat of infection, it takes place through the vagina, uterus, and tubes. This is especially so in woman who have given birth to children. In the case cited the patient was unmarried and was undoubtedly a virgin; therefore, it would seem to me very improbable that the infection came through the vagina. It is more plausible to ascribe it to the inhalation method and the germs entering the lymphatic circulation found lodgment in the tissues.

In the treatment of these cases surgery, so far, seems to give the best results.

As to how the advancement of the disease, when confined to the peritoneum, is stopped and the patients cured by a simple celiotomy, is not quite clear to me, although various theories have been advanced to explain it.

The subject of tuberculosis is too large to elaborate in this report, but it is to be hoped that the efforts now being put forth will, in the near future, find us a specific for the cure of this destructive disease.

DISCUSSION.

DR. STONE, in opening the discussion, said that the case reported showed the possibility of wrongly raising suspicions in virgins with inflammation of the tubes by expecting all pus tubes to be of gonorrheal origin. In virgins tubercular infection should always be considered. The treatment with bismuth injection was to be commended in view of the recent work on the treatment of tubercular sinuses. The origin of the infection was still in doubt. The pain was not felt until the disease was fairly well advanced with adhesions to the parietal peritoneum. There was no vaginal discharge. The infection might be either by the vaginal or the systemic route. The vaginal infection was shown in the cases of persistent erosion of the cervix proceeding the tube infection. The early diagnosis was not yet possible and the earliest radical cure was by surgery. He noted the case of a girl of twenty-six years, operated on for pyosalpinx. Following the operation there was persistent loss of weight and the drainage from the wound continued for three months. He thought that the rationale of the cures of tuberculous peritonitis was not known, but that it seemed as if the cases with primary infection of the peritoneum got well oftener than those of primary infection of the mucosa.

DR. BALLOCH said that this case seemed to him to be one of

mixed infection since the pure tubercular cases were painless and without much fever. Here a secondary infection with colon bacillus seemed probably also from the odor of the pus. The infection in this case seemed to be from the mucosa on account of the presence of giant cells in the mucosa. The result here had been excellent.

DR. MILLER said that the diagnosis was very important and that double pus tubes in the virgin could usually be assumed to be tubercular. Gonorrheal infection might occur in a virgin, though it was not probable. Infection with tuberculosis through the vagina was rare and he had not been able to find any positive cases reported in literature. An ascending infection ought to show an accompanying metritis and vaginitis of the tubercular type. The source of the tubercular peritonitis from lymphatics and the later extension to the tubes was more common.

DR. STONE called to mind a case seen at the Mayo's clinic with ascites accompanying peritoneal irritation in the right inguinal fossa. The wife of the patient had been operated on previously for a tubercular kidney, and in this case the preoperative diagnosis confirmed by the pathologist was tubercular appendicitis.

REVIEWS.

DUODENAL ULCER. By B. G. A. MOYNIHAN, M. S. (London), F. R. C. S., Senior Assistant Surgeon at Leeds General Infirmary, England. Octavo of 379 pages. Philadelphia and London: W. B. Saunders Co., 1910. Cloth, \$4.00 net.

This is a clear exposition of the history, pathology, symptoms, diagnosis, prognosis, and treatment of duodenal ulcer, a comparatively common and important condition, of which our practical knowledge in the living dates back only about ten years, and is largely due to the labors of the author of this book. In this volume he clearly shows that symptoms the older physicians believed to be due to derangement of the functions of the stomach, as hyperchlorhydria or neuroses, are really due to organic disease, and that of the various forms of this organic disease duodenal ulcer stands out the clearest.

THE PATHOLOGY OF THE LIVING AND OTHER ESSAYS. By B. G. A. MOYNIHAN, M. S. (London), F. R. C. S., Honorary Surgeon to Leeds General Infirmary; Professor of Clinical Surgery at the University of Leeds, England. 12mo of 260 pages. Philadelphia and London: W. B. Saunders Company, 1910. Cloth, \$2.00 net.

The reading of this little volume is a pleasant stimulus to one's mental processes and effectively wakes up an interest in the

important question of early diagnosis of intraabdominal conditions.

The author truly writes: The literature of medicine has been too much concerned with terminal events. It is necessary for us now to devote our closest inquiry to the very earliest disturbances of health so that medical treatment of a condition whose authentic nature is known may be more purposeful, and surgical treatment, when necessary, adopted at an earlier and in a safer stage. One result of the great increase in the number of abdominal operations in recent years is that the organic diseases affecting the several viscera are being recognized in earlier stages, and that the symptoms aroused in these stages are being given a proper interpretation. Another result is the lessening of the number of so-called "functional diseases" by a recognition of the fact that they are chiefly dependent upon demonstrable changes in structure. If the works of medicine of a quarter of a century ago are examined, it will be realized that a very great majority of the cases of "dyspepsia" were then attributed to functional derangements. We now know that among the conditions so described were many organic diseases, such as duodenal ulcer, some of the forms of cholelithiasis, and last but certainly greatest, chronic appendicitis. He believes that time will show that possibly all, certainly nearly all, of the cases of protracted and recurring "dyspepsia" are due not to vices of secretion, though indeed these may be present, but to organic changes in one or other of the viscera.

TEXT-BOOK OF GYNECOLOGICAL DIAGNOSIS. By DR. GEORG WINTER, Professor and Director of the Kgl. Universitäts-Frauenklinik in Königsberg, Prussia. With the collaboration of DR. CARL RUGE, of Berlin. Edited by JOHN G. CLARK, M. D., Professor of Gynecology at the University of Pennsylvania. pp. 670. Illustrated by four full-page plates and 346 text illustrations in black and colors. 1909. J. B. Lippincott Company, Philadelphia and London.

This book fills a well-defined place, is a distinct addition to gynecological literature, and should be indispensable to every teacher and to every practitioner of gynecology. It is difficult to say too much in praise of it. The text is clear and concise, and so effectively illustrated that all important points are brought out in sharp relief.

Dr. Clark, in his preface, very truly says: "The history of American gynecology is replete with brilliant achievements, and much of the pioneer work of such pathfinders as McDowell, Sims, the Atlees, Hodge, Emmet, Skene, Goodell, and others, has been incorporated in the basic principles of modern diagnosis and treatment of the diseases of women. This work so conspicuously begun by our countrymen has been worthily maintained by a large number of skilled successors, who are still in the zenith of their careers.

"Although much has been established in the practice of gynecology in the United States, we owe much to English and Continental gynecologists for the discovery and inauguration of many essentials in theory and practice, and especially must we pay tribute to the painstaking research of German specialists, who have been indefatigable co-workers in creating from a minor field a great specialty, which takes equal rank with other representative branches of medicine. To their epoch-making discoveries in embryology, to their careful elaboration of the topographical anatomy and histology of the generative organs, to their infinite patience in the investigations relating to the pathology and bacteriology of the diseases of women, to their establishment of various principles relating to surgical and therapeutical treatment, and to their faithful study of the ultimate results of operative measures we may attribute much of the progress of this specialty.

"Of the younger school of German gynecologists, Professor Winter occupies a representative position, and his experience as a teacher of gynecology, first in the University of Berlin, and later in the University of Königsberg, has amply fitted him to write a practical book on gynecologic diagnosis, judiciously leavened, but not overburdened with the science of this subject.

In addition to the practical part of the book, which has been so carefully prepared by Professor Winter, Professor Carl Ruge, the distinguished investigator and teacher of microscopic diagnosis, has contributed a very valuable section on this subject and its important bearing on the etiology, diagnosis, and treatment of the diseases of women. That the laboratory must often be the court of final resort in the early diagnosis of cancer is convincingly demonstrated by this master."

Because of the merit of this German text-book, Dr. Clark holds it a pleasure to stand sponsor for this English translation.

Such brief editorial annotations as seemed essential have been added in brackets.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Extrauterine Pregnancy.—P. B. Bland (*Amer. Jour. Surg.*, Dec., 1909) says that the points which should lead one to make a diagnosis of ruptured extrauterine pregnancy, after eliciting the history of a possible pregnancy, are: At the moment of attack, the patient was in her normal health. The gradually increasing pallor of the patient and the increased rapidity of the pulse without corresponding rise of temperature are both indicative of internal hemorrhage; extreme tenderness of the abdominal wall is also of special value. On careful questioning, in nearly

all instances a history of some menstrual disturbance will be elicited, despite the fact that many authors claim that amenorrhea occurs in only 50 per cent. of the cases. In all cases of irregular menstruation or bleeding from the genital tract, a bimanual examination is imperative. No physician is justified in concluding that a patient presenting a history of irregular menstruation is having a premature birth. In all cases of ruptured ectopic gestation, a positive diagnosis can be made by incising the posterior vaginal wall and this opening can be utilized in establishing abdominal drainage. All cases of ectopic pregnancy, whether before, during, or subsequent rupture, are best treated through an early abdominal incision.

Elis Essen-Möller (*L'Obstet.*, Feb., 1910) combats the idea that it is ever safe to delay operation in cases of extrauterine pregnancy. The patient is always in danger of hemorrhage and sepsis. Hemorrhage may come on at any time and be fatal. There is frequently the necessity of later operation for complications of a serious nature, made under unfavorable circumstances. It necessitates a long convalescence, during which the patient must keep her bed. Statistics which are used to demonstrate the advantages of the expectant treatment are misleading in that they contain many cases in which extrauterine pregnancy did not exist. Immediate operation offers no more risks than later operation or than any other abdominal operation. It will save the life of most patients, and especially those that would die at once without operation from hemorrhage or other complications. The author bases his opinions on forty-eight cases of extrauterine pregnancy operated on with one death.

Oleic Acid as the Cause of Eclampsia.—O. Polano (*Zeit. f. Geburts. u. Gyn.*, Bd. lxx., H. 3) discusses the possibility of oleic acid derived from the placenta being the cause of eclamptic poisoning in pregnancy and labor. If this were the case it would be necessary that the oleic acid should be found in more than physiological amount in the placenta, and should have a poisonous effect on the blood cells, causing anemia through the action of sodium oleate. The action of this poison would also have to be sudden. It would result only from a direct action of the sodium oleate on the central nervous system, an action which it is known that this drug does not produce. The author has made an examination as to the amount of oleic acid to be found in the placenta in a normal condition and in a condition of eclampsia; whether there is a difference in the amount of oleic acid to be found in the blood of a case of eclampsia and that of a normal woman, and whether in cases of eclampsia sodium oleate is to be found in the urine. For this purpose he examined the placenta in two normal cases and two cases in which the severest form of eclampsia had caused death; the blood obtained by venesection in a case of eclampsia and that of a nongravid case of carcinoma, and the urine obtained immediately after and

three to five days after eclampsia. The author describes his methods and tabulates his results. Oleic acid was found in the normal as well as the eclamptic placenta; it is contained in the villi, and in the membranes and the cord even more than in the villi; no difference was to be found between the normal and the abnormal placenta; the blood of an eclamptic contains no more sodium oleate than normal blood; the urine obtained immediately after the convulsions differs in no way from that several days later. The blood cells are found to be increased rather than diminished in eclampsia. The author believes that the chemical analysis, experiments on animals, and the clinical and anatomopathological results are against the causation of eclampsia by oleic acid.

Prognosis of Hydatidiform Mole According to the Histological Examination of the Decidua.—G. Durante and E. Paquay (*La Gyn.*, Jan., 1910) draw attention to the changes of the vessels in the mole, which seems to be the cause of this pathological condition of the placenta. It results from a lesion of the vessels of the villi, probably of toxi-infectious nature, which causes an obliteration and disappearance of the vessels of the villi and the villous trunks, leaving intact the blood spaces and the syncytium. A hypernutrition follows, with hyperplasia of the syncytium and formation of a vesicle by inhibition in the villi of products which would naturally pass to the fetus. The Langhans layer vegetates, still preserving the epithelial covering, and forms a hydatid vesicle. This remains a complex organ, a pathological villus, remaining entire, represented by its mesoderm surrounded by its epithelial covering. This structure is similar to that of an adenoma, and a mole may be described as an adenoma of the placenta. Cancer, on the contrary, breaks all bounds and destroys tissues. A mole, like an adenoma, may go on for a long time growing without any signs of malignity. It may undergo fibrous retrogression. When a malignant transformation takes place, the regular growth is abandoned, tissue bounds are broken through, and neighboring tissues are destroyed. It is exceptional for this degeneration to take place, however. In the great majority of cases it is expelled whole. Deciduoma develops at the expense of placental debris in general. More important than the vitality of the villi is the depth of the placental graft and the amount of defense that the uterine wall can make against it. This defense is made by the decidua which becomes thicker. The normal decidua is a sufficient barrier against the physiological villi. When they undergo excessive growth the maternal organism reacts against this growth by thickening the decidua, which becomes infiltrated with small cells. This defense is proportional to the amount of vegetative activity. If it is insufficient it will be broken through by the epithelial elements of the decidua which, invading the uterine wall, become a malignant deciduoma. In presence of a hydatidiform mole, a histological examination should be made of the decidua in as many points as possible. The prognosis

will be better as we find the reaction more intense and perfect in the portions studied.

Incontinence of Urine Following Labor.—G. B. Miller (*Surg. Gyn. Obst.*, Jan., 1910) reports five cases of prolonged incontinence of urine after labor. He says that the incontinence which comes on immediately after labor, due to swelling, etc., of the urethra and bladder neck, as a rule soon subsides without treatment. If it does not, one should make a careful examination of all the pelvic organs, replace a retroposed uterus when necessary, hasten involution of the pelvic structure by douches, tampons, pessaries, etc. In persistent or increasing incontinence some operative procedure is usually necessary. The nature of the operation should depend upon the condition of the urethra and bladder neck. The Frank operation, combined with an anterior and posterior colporrhaphy in cases where there is a relaxed and gaping vagina, and some appropriate operation for retroversion where this exists, will cure the average case of incontinence coming on after labor, and of not too long standing. In cases where there is a marked dilatation of the urethra of long standing or cases where from necrosis the muscular walls of the neck of the bladder and urethra are wanting, Gersuny's operation seems to offer the best hope of cure. Pawlik's and Dudley's operation have likewise given good results at the hands of their originators.

Changes in the Normal Endometrium During Menstrual Life.—C. C. Norris and F. E. Keene (*Surg. Gyn. Obst.*, Jan., 1910) have reviewed the histories and examined the curettings of 100 patients operated on in the gynecological clinic of the University Hospital during the last ten years, accepting only those in which no lesion, such as fibromyoma, cysts, or inflammation was present, and in which a history of regular menstruation was given. They state that the endometrium in the normally menstruating woman undergoes a complete and definite cycle every twenty-eight days. This cycle is best divided into four periods which blend into each other. During the period which constitutes the premenstrual process, the endometrium takes on all of the changes common to the decidua vera at a very early stage, only at this time the changes are of a lesser degree. As soon as free hemorrhage occurs, the congestion is relieved. The postmenstrual and interval periods constitute a process of repair. Each of these periods possesses definite histological characteristics, the most typical changes being found in the premenstrual and postmenstrual periods. The periods blend into each other and are subject to slight variations in different individuals. The menstrual period lasts from four to six days, the postmenstrual three to five days, the interval from ten to twelve days, and the premenstrual about ten days. It is therefore important that the pathologist, when examining endometrium, should know when the last menstrual period occurred. This knowledge, combined with an understanding of the changes during the various transformations of the normal endometrium, will show that many of the cases diagnosed

as glandular or interstitial endometritis are nothing more than different periods of the normal endometrium; and, consequently, that endometritis, in the true sense of the term, is much less frequent than is commonly thought. In the classification of endometritis, the writers recommend its division into acute and chronic, doing away with the cumbersome and faulty classifications which are now used.

Treatment of Abortion.—In a brief statistical review of 750 cases occurring in the out-door Department of the Chicago Lying-in Hospital, H. M. Stowe (*Surg. Gyn. Obst.*, Jan., 1910) calls particular attention to the following points in the treatment of abortion: 1. The importance of treating all cases of uterine hemorrhage accompanied by intermittent pelvic pain in a woman of childbearing age as acute abortion. 2. The value of absolute rest in bed in the treatment of threatened abortion until all pain and bleeding have ceased. 3. The necessity of saving as much blood as possible to avoid a long period of anemia and prostration. 4. The selection of cotton pledgets in lieu of gauze strips as a material for vaginal tamponage. 5. The use of finger curetment and manual removal of the uterine contents whenever possible. 6. The performance of Hoening's abdominovaginal compression when the conditions are present. 7. The difficulty of complete sterilization of laminaria tents. 8. The danger of perforation of the uterus with steel dilators and sounds. 9. The great danger of uterine perforation with the steel curet in acute abortion and the value of the instrument in chronic abortion. 10. Curetment should be raised to the dignity and seriousness of a surgical operation and be performed under the same surroundings and with the necessary equipment. 11. The importance of refraining from curetting after the complete emptying of the uterus. 12. The use of ergot after the uterus is empty. 13. Local interference in septic abortion when the infection is limited to the uterine cavity. Less tendency to interfere when the adnexa or peritoneum are involved in the septic process.

Strength of Uterine Scar after Cesarean Section.—N. R. Mason and J. T. Williams (*Bost. Med. and Surg. Jour.*, 1910, clxii, 65) subjected a number of pregnant animals to Cesarean section, performed as nearly as possible after the method used in human beings. Seven recovered and were killed after varying periods of time, in each case at least great enough to allow the development of a full-term gestation. Comparative tests were made of the muscle and scar by applying weights to a section of uterine wall containing both. In every case the muscle gave away first; in one instance only the rupture extended secondarily into and along the scar, while in another it passed through the scar at right angles to it. Two animals were again pregnant and near term when the test was made, the result being the same as in those which were not, thus ruling out any change in the strength of the scar during pregnancy. The writers conclude that a carefully sutured and well-united scar will withstand any strain

which can be endured by the uterine muscle. Rupture of a Cesarean scar is always secondary to unusual weakness of the scar, dependent upon imperfect consolidation. The most frequent cause of imperfect consolidation is placing the deep stitches too far apart, or not including the entire thickness of the uterine muscle. Location of the incision and suture of the placental site probably do not affect the strength of the scar. Infection, in certain instances, plays a very important part in causing weakness of the cicatrix. Catgut as a suture material is open to the objection that there is at least a possibility of the stitches becoming untied, and that certainly more cases of rupture have occurred after its use than after the use of silk.

Ovarian Pregnancy.—E. M. Prince (*Jour. Amer. Med. Assn.*, 1910, liv, 461) reports the removal of an enormously distended right ovary which was found to contain a dead child fully developed, weighing 7 1/2 pounds. Owing to the findings of the pathologist and the fact that the right tube could be demonstrated as separate and distinct from the tumor the writer feels justified in calling this a case of true ovarian pregnancy. Specimens of tissue were removed from six approximately equidistant points on the sac. Each showed so-called corpora albicantia and stroma identical in appearance with that ordinarily found in the ovary.

Diagnosis and Treatment of Ectopic Pregnancy.—It is claimed by Hunter Robb (*Ohio State Med. Jour.*, Jan., 1910) that in a woman suffering from a ruptured ectopic pregnancy death is caused mainly by shock, which may be increased by various procedures and especially by operation. The hemorrhage *per se* is rarely, if ever, the sole cause of death. An immediate operation may add shock to shock and so prevent recovery. From an experimental standpoint the hemorrhage ceases in from fifteen to twenty minutes. The fact that the hemoglobin remains stationary shows that clotting has taken place. In dogs the subcutaneous injection of salt solution improves the pulse and respiration and does not start the hemorrhage up again. The use of bandages or proper weights by which the anterior and posterior abdominal walls are approximated is likely to improve the condition of these patients. When the diagnosis of ectopic pregnancy is certain, operative measures are indicated; but in most cases the danger is not sufficiently imminent to warrant immediate interference unless the condition of the patient is otherwise satisfactory. Many women recover even without an operation. Not more than 5 per cent. of the victims of ectopic pregnancy die at the time of rupture, whereas after the immediate operation in cases of ectopic gestation in 1,176 cases in twenty-five clinics the mortality was 8 per cent. When a patient is seen in a state of collapse, as the result of a ruptured ectopic sac, she should not be operated on until the condition of shock has been tided over. A woman weighing 130 pounds must probably lose four pounds of blood before succumbing to

the effects of the hemorrhage *per se*. So large an amount of blood is rarely found in the abdominal cavity—the sanguinous fluid is a mixture of blood and a serous exudate. The sudden removal of a large quantity of recently accumulated fluid in the abdomen, before the other vessels have had time to adapt themselves to the altered mechanical conditions, is dangerous and may be followed by fatal syncope. Patients in whom the bleeding would be sufficient to cause death are rarely seen in time to be saved by an operation for ligating the bleeding vessel. Our best operators give a percentage of 40 or 50 per cent. as their death rate after immediate operation during shock. So long as there is reasonable evidence that immediate operation may be the wrong procedure, it is our duty to hold our hands and leave something to nature.

Conditions Simulating Tubal Pregnancy.—H. S. Crossen (*Jour. Amer. Med. Assn.*, 1910, liv, 519) reports and quotes a number of cases which simulated tubal pregnancy. They are included in the following classes: 1. Gonorrheal pyosalpinx may lie dormant, after the acute symptoms have subsided, for several years, and an acute exacerbation may occur at any time. Such a condition must be excluded by inquiry for a history of gonorrheal symptoms, careful examination for evidences of a chronic urethritis, Bartholinitis, endometritis or salpingitis; and staining for the gonococcus any suspicious discharge that may be obtained from the urethra, vulvovaginal glands, uterus, or vagina. In chronic cases negative findings do not exclude gonorrhea, for the gonococcus disappears from the discharge after a time. 2. In rare cases acute gonorrhea may extend rapidly through the uterus to the tubes and peritoneum, with so little disturbance of the vagina and vulva as to arouse no suspicion of its presence. In a case with acute discharge it is advisable to examine for gonococci, even though the discharge be scanty and bloody and apparently nonpurulent. 3. An early miscarriage, if associated with a tumor or followed by mild salpingitis, may very closely simulate tubal pregnancy. If a shred of tissue is passed it may be examined for chorionic structures. In a case which cannot be decided otherwise, curetment is advisable to obtain tissue for microscopic examination for chorionic villi. 4. A pregnant uterus may present very misleading conditions: *e.g.*, irregular softening, displacement, backward or forward or laterally; hyperesthesia with displacement or irregular softening or an associated lateral mass (salpingitis, etc.). 5. An unsuspected tumor in the pelvis may give rise suddenly to severe disturbance, and the early symptoms of pregnancy (missed menstruation, stomach disturbance, breast tenderness and softened cervix uteri) often appear without satisfactory cause. 6. Ovarian hemorrhage or tubal hemorrhage, due to other conditions, may so closely simulate extrauterine pregnancy as to be indistinguishable before operation, and in some cases even after direct exposure and handling of the affected

structures. 7. Salpingitis, appendicitis, and perforations in the gastrointestinal tract may, in rare cases, come on so suddenly and progress so rapidly as to suggest internal hemorrhage from extrauterine pregnancy. Usually in these conditions there are preceding or accompanying symptoms which point to the true nature of the disease. 8. Fulminating pelvic edema with its sudden onset and the rapid development of alarming symptoms may closely resemble extrauterine pregnancy. In this, as in other conditions of nonhemorrhagic shock or depression, there is not the persistently blanched condition of the skin so characteristic of profuse hemorrhage. The pulse, also, though rapid, is likely to have better volume than after a severe hemorrhage.

Prevention of Puerperal Fever.—Pankow (*Zent. f. Gyn.*, Feb. 19, 1910) says that there are two ways of increasing the resistance of the puerperal patient to infection: one is by improving the general condition; the other is by the use of antitoxic serum. An artificial hyperleukocytosis will aid in the first method of prevention. To produce such a leukocytosis the author has made use of nuclein injected subcutaneously, using 50 c.c. of a 2 per cent. solution. There was an immediate increase in the leukocytes. The author tabulates the results in twelve cases treated in this way. The author injected 10 c.c. of antistreptococcus serum with the result that in forty-nine injected cases, thirteen showed streptococci in the uterus, and of forty-nine not injected, fifteen showed them. Of the forty-nine injected women, eight had fever in the puerperal period; of the uninjected, five showed fever. The results do not justify this treatment as a routine procedure.

Acute Thyroiditis in the Course of Puerperal Infection.—P. Lecine and Metzger (*Ann. de gyn. et d'obst.*, Feb., 1910) recite the case of a woman confined by a midwife and douched with unsterilized water, who developed on the second day a mild infection, from which arose an abscess of the thyroid gland. Suppuration occurred, the abscess was opened, and recovery ensued. This complication is regarded as a very serious one. Suppuration may occur in a previously existing goiter, which is not a true infection; or in a previously healthy organ, a true acute thyroiditis. It begins abruptly with a chill and swelling in the thyroid region, diagnosis being easy on account of the superficial location of the gland. It may involve the whole or only a part of the gland. The swelling moves up and down with the ascent of the trachea and in deglutition. The frequency of thyroiditis in women shows that they have a predisposition to it. The thyroid participates in congestion of the genital organs during menstruation and in pregnancy. In many pregnancies the thyroid has become enlarged, and is particularly susceptible to infection; still suppurations in the puerperal state are rare. Simple local palliative treatment is indicated, with incision if necessary.

Ovarian Tumor Complicating Pregnancy, Labor, and the Puerperium.—G. B. Marshall (*Jour. Obst. Gyn. Brit. Emp.*, 1910, xvii, 81) discusses the treatment as indicated by eight personal

cases and the experience of others. He says that practically all operators agree that the correct treatment for unilateral or bilateral ovarian tumors, with or without complications, during the first six months of pregnancy, is to have them removed as soon as discovered, provided there is no absolute contraindication to operation. The majority of operators favor ovariectomy during the late as well as the early months of pregnancy, but a few, owing to the much greater risk of interrupting gestation as compared with the first five or six months, advocate expectant treatment till full time in order to ensure a viable child. The present view is that ovariectomy during labor, for tumors abdominal in position, should be undertaken only if the growth absolutely prevents the passage of the child. If the tumor obstructs labor, and there is no contraindication to waiting, ovariectomy may be delayed till the end of the first stage, and the child delivered immediately after by forceps. In all other cases labor is left to nature, and, should occasion demand, is aided by dilatation of the cervix, use of forceps or manual delivery of the placenta. If the ovarian tumor is pelvic in position, attempts to deliver by forceps, version, or craniotomy are absolutely contraindicated until the obstruction has been removed. In no case should valuable time be lost in seeing what nature will do, for the earlier in labor the obstruction is removed, the better for mother and child. There are four possible methods of treatment: 1. Reposition. Unless contraindicated this should be tried first, avoiding excessive force and consequent risk of rupture. It frequently fails, is by no means devoid of danger, and has been responsible for a much higher percentage of deaths than intrapartum ovariectomy. 2. Puncture or incision per vaginam. Where early removal of the obstruction is imperative and skilled help impossible to obtain within a reasonable time, these are the only alternatives to a practitioner who does not feel himself in a position to attempt a major operation. 3. Ovariectomy has given the best results, and is therefore the best treatment where reposition fails. The vaginal route should only be chosen if the tumor is cystic, free from adhesions, and has a long pedicle which can be easily and securely controlled. These necessary factors to success are difficult to determine, therefore the abdominal route is better, being suitable for all cases. 4. Cesarean section is rarely called for, and should be reserved for those cases where ovariectomy is impossible without it, owing to the tumor being too firmly impacted, densely adherent, or intraligamentous. It is the only alternative for an inoperable tumor. As regards ovarian tumors in the puerperium, if one is recognized at labor, as in the case of tumors abdominal in position, or in those instances where reposition of a tumor pelvic in position has been effected, ovariectomy should be performed in the first week of the puerperium, even if no urgent symptoms arise. If the tumor was punctured or incised per vaginam as a temporary measure for removing the obstruction it should be removed not later than the second

day of the puerperium. Urgent symptoms, as from torsion, demand immediate operation as soon as they arise. It is unsound advice to recommend or sanction the patient to wait till her child is weaned.

Treatment of Labor in Contracted Pelvis.—On the basis of several recent Austrian and German statistical presentations, E. O. Houck (*Cleve. Med. Jour.*, Feb., 1910) offers the following summary of the treatment of labor in cases of contracted pelvis: *Conjugata vera* 5.5 cm. or less: Cesarean section. *C. v.* 5.5 cm. and upward: Craniotomy on the dead fetus. *C. v.* 5.5 to 6.5 cm.: Cesarean section for relative indication when the fetus is still living. *C. v.* 6.5 to 7.5 cm.: Hebosteotomy only with an uncomplicated vertex presentation, small head with good flexion, and a living child. *C. v.* 6.5 to 7.5 cm.: Cesarean section for breech presentations, oblique presentations, and in vertex presentations when it is necessary to deliver rapidly, or when the mother is very desirous of having a living child. The uterus must not be infected. Hebosteotomy may be done before the os is dilated if we are reasonably certain of a small head. If the membranes are not ruptured it is better to wait until the os is completely dilated before doing the operation; if the membranes have ruptured then do a hebosteotomy as early as possible so the head can descend. Do not use a dilating bag because it might cause a deflection of the head. *C. v.* 7.5 cm. and upward: Always endeavor to bring about spontaneous labor, and only when during the course of labor we are convinced that spontaneous delivery cannot take place do hebosteotomy if the child is living and the head is not too large. *C. v.* 7.5 to 8 cm.: Do hebosteotomy if the child is living and follow this by version and extraction: *a.* In oblique presentations. *b.* In head presentations with prolapse of the cord. *c.* In breech presentations. *C. v.* 7.5 to 8 cm.: In a multipara with a small child version may be attempted without previous hebosteotomy. *C. v.* 8 cm. and upward: Await spontaneous delivery. Version for indicated reason. Application of the forceps with complete dilation of the cervix. Forceps should be applied as a trial operation when, if not successful, hebosteotomy is indicated. Always endeavor to wait for spontaneous delivery after performing hebosteotomy. *C. v.* 8 cm. and upward: In multiparæ induce labor if the mother gives a history of having previously given birth to large children; do not permit the mother to go overtime even when awaiting the onset of labor pains and spontaneous delivery. *C. v.* 8.5 cm. and upward: Forceps, version if indicated, hebosteotomy.

GYNECOLOGY AND ABDOMINAL SURGERY.

Leukoplakic Vulvitis and its Relation to Kraurosis Vulvæ and Carcinoma Vulvæ.—C. Berkeley and V. Bonney (*Proc. Roy. Soc. Med.*, vol. iii, No. 2, Obst. and Gyn. Sect., p. 29) endeavor to show that leukoplakic vulvitis and kraurosis vulvæ are

two distinct diseases. They define leukoplakic vulvitis as a chronic inflammatory condition of unknown origin characterized in its early stages by marked hyperæmia and cellular activity, and in its later phases by marked epithelial hypertrophy and a thickened sclerosed and retracted condition of the subepithelial tissue. The striking and often the only symptom of leukoplakic vulvitis is pruritus, which is peculiarly intense in the early stages. Later the pruritus is more or less masked by the pain and acute sensitiveness due to the exposure of the nerve-endings in the floor of the ulcer or crack. Finally the symptoms disappear. If carcinoma supervenes at the third stage the ulcers become very painful and tender, bleed easily on being touched, become hard and indurated in spite of local treatment, and enlarge fairly rapidly. Kraurosis vulvæ consists of an atrophic condition of the vulva associated clinically with stenosis of the vaginal orifice and pathologically with certain changes in the dermis. The principal symptoms are soreness, pain, dysuria, and dyspareunia. Pruritus is one of the rarest symptoms. In the first stage of the disease the parts are extremely sensitive, the passage of urine gives pain, and coitus, for the same reason, is hardly endured or is impossible altogether. In the second stage the soreness may entirely disappear, but owing to the retraction of the vaginal orifice dyspareunia becomes common to both parties. Leukoplakic vulvitis is, in the writers' opinion, an antecedent condition and the cause of carcinoma of the vulva. What is the cause of leukoplakia is a much more difficult question to decide. It is evidently due to some damage to, or interference with, the resisting power of the surface epithelium of the labia; and although coition as a cause of this cannot be insisted upon in every case, it seems to be one of the chief causes when it is remembered that 84 per cent. of the writers' patients at least have been subjected to coition, and that the age of incidence corresponds fairly closely to the limit of the most active period of this function; while the question of parity is of no assistance, since practically the parous and sterile women are in equal numbers. In none of the writers' cases was there any history or signs of antecedent syphilis, nor could evidence of the presence of the spirochæte be obtained by histological methods.

Late Accidents in Chloroform Anesthesia.—H. Roulland (*La Gyn.*, Jan., 1910) speaks of the bad results of administration of chloroform which occur from one to several days after its use. He has collected sixteen cases besides one personally observed by him. In these observations it is noticeable that the important alterations in organs affect the liver and kidney. The author's case had a mild uterine infection, but the patient was in good general condition, and presented no signs of acute infection. It is probable that in such cases it is the chloroform which plays the important part. It may be that there was a congenital weak condition of the liver, or that the chloroform finished the possibility of reaction in an already diseased liver. There may

be an accumulation of chloroform in the system. There is found a true necrobiosis by degeneration of granulo-fatty nature in these organs. The clinical symptoms are nervous, beginning with headache and vomiting, painful and distressing to the patient. The patient becomes terrified, excited, has trismus, epileptic crises, respiration becomes irregular, of Cheyne-Stokes type, auscultation shows râles and signs of congestion, the pulse is rapid and thready, urine diminished and full of albumin, and the scene ends with coma. The prognosis is very bad and treatment has little effect.

Postoperative Tetanus.—R. Peterson (*Jour. Amer. Med. Assn.*, 1910, liv, 108) records a case of tetanus developing twelve days after shortening of the round ligaments and terminating in recovery. The tetanus bacillus was not isolated from the wound. Reviewing and tabulating the reported cases, the writer says that tetanus occasionally follows all kinds of gynecologic operations. It most frequently is a complication of operations involving the opening of the peritoneal cavity, although in quite a percentage of cases it complicates plastic and other nonperitoneal operations. The infection in all probability is introduced at the time of operation. The tetanus bacillus and its spores are most difficult to kill, and under certain circumstances they survive boiling for sixty minutes; hence when this organism is present more than ordinary heat, applied over a longer time, is necessary. Absorbable ligatures, like catgut, may be carriers of the infection, unless the most approved methods of sterilization be employed. The process of manufacture of the catgut renders it peculiarly liable to infection by the tetanus bacillus, which may not be destroyed by the ordinary methods of chemical sterilization. The initial symptoms of postoperative tetanus appear within ten days in from two-thirds to four-fifths of the cases. The onset of symptoms in the remaining cases varies from the eleventh to the twenty-second day after the operation. In the 150 cases tabulated no case showed symptoms of tetanus the first two days after the operations. From a study of these cases it would seem that the average period of incubation for postoperative tetanus was about eight days. The shorter the incubation period the more virulent and active the disease, and, conversely, the longer the incubation the milder the disease or the longer is it possible for the patient to survive before a fatal issue. Whenever possible the point of entrance of the tetanus bacilli should be ascertained and the proper disinfection and drainage be instituted. This is often difficult in cases of postoperative tetanus. Antitetanic serum acts on the free toxins in the blood, but has no effect on the toxins after they have become fixed in the nerve cells. A study of the tables shows that the mortality of tetanus has been reduced nearly 10 per cent. through the use of the antitetanic serum. The best effects of the serum will be seen when its administration is begun on the first appearance of the symptoms

of the disease. Chloretone is able to control the muscular spasms of tetanus and to do away with the muscular rigidity. It is harmless and does not prevent elimination. In tetanus, elimination through free catharsis and the administration of salt solution is of the utmost importance.

Rectal Myomata.—F. Descoeurdes (*Rev. de gyn. et de chir. abd.*, Jan., 1910) considers that myomata of the rectum are rare growths; among eighty cases of myomata of the intestine that have been published only sixteen involved that organ. They may be external or internal. When internal they constitute polypi with a pedicle of varying length. Of external myomata about a dozen are known growths of large size and difficult of diagnosis. Some develop upward into the pelvis, others backward into the sacroiliac fossa and rectovaginal region. The author describes a case that is unique, a tumor which developed outside the body, so to speak, under the skin of the buttocks, hanging downward, so that the patient sat upon it without experiencing any pain. It had a large fibrous pedicle attached to the upper part of the rectum. These tumors develop at the expense of the muscular portion of the rectal wall. Irritation and congestion of the intestine are predisposing causes; some believe that they are of embryonic origin, and caused to develop by irritation. They grow very slowly. The symptoms are constipation, hemorrhage, tenesmus and signs of pressure. There may be edema of the lower extremities from pressure on the trunks of the vessels. The prognosis of such a tumor, if left to itself, is bad; it may cause death by obstruction of the bowel, by hemorrhage, or by malignant transformation. The only treatment is extirpation.

Gonorrhea in Young Women.—In a series of about seventy cases of gonorrhea in young women, J. C. Hollister (*South. Cal. Pract.*, Jan., 1910) found, as regards the disappearance of gonococci, the clearing up of discharge, and the improvement in pelvic findings, that the cases treated with vaccine and antigonococcic serum tally in the number of points of value; that the vaccine alone and vaccine plus ichtyol give results of approximately equal value, while silver nitrate comes last. The advantages of the vaccine are: 1. The volume of the dosage is very small, only one-fourth of that of the serum, hence there is practically never any local reaction. 2. The interval between the injections is three times as long as the interval between the injections of the serum. 3. The preparation of the vaccine is very much simpler than that of the serum, as it does not necessitate immunizing animals. The greater frequency of the dosage of serum and its more difficult preparation make the serum treatment considerably more expensive than that of the vaccine. The examination of smears made from the cervix, as well as from the vulva, vagina, and urethra, is of vital importance in the diagnosis of gonorrhea in many cases. The absence of a vulvovaginal discharge by no means rules out the diagnosis of gonorrhea.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

FRIEDREICH'S ATAXIA.*

BY

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It was on the eighteenth of September, 1861, that Friedreich, professor of medicine in Heidelberg, presented to the Thirty-second Congress of German Naturalists and Physicians, assembled at Spiel, a new and unusual type of locomotor ataxia.

The features of this new type were threefold:

1. The fact that the disease developed very early in life.
2. The fact that more than one member of a family was afflicted.
3. The absence of lancinating pains, of sensory symptoms, and of bladder disturbance.

Friedreich, at this Congress, showed six of these cases. Carre reported one in 1865, and gradually others followed. By 1889 there were 143. Since then many have been added, so that in all there have been recorded about 200 cases. To this I shall add four.

It was Brousse who, about ten years later, in the early '70s, in adding to the number of cases, suggested giving to this group the name of their original observer, and so permanently established the identity and entity of Friedreich's ataxia.

The characteristic features of Friedreich's ataxia are:

1. Ataxia.
2. Deformities.
3. Familial trait.
4. The loss of knee-jerk.
5. The early onset.
6. Disturbance of speech.

* Cases III and IV were shown before the Pediatric Section of the Academy of Medicine, N. Y. I wish to acknowledge the courtesy of Dr. Charlton Wallace of the East Side School for Crippled Children, who was good enough to allow me to see these two cases.

1. *The Ataxia.*

The ataxia in Friedreich's is twofold in type. There is present both the motor ataxia, which is so characteristic of tabes, and there is present in addition to this a type of ataxia, which is quite characteristic of this particular affection and to which Friedreich himself gave the name of "static ataxia."

The motor ataxia is not altogether a pure ataxia; it has some of the cerebellar type of ataxia; it is a less disorderly form; the patient makes less noise and the feet are brought down with less emphasis and less noise. The patient sways and reels more but does not appear to be so uncertain; the hands and the rest of the body sway with the legs; the patient appears to help himself more in Friedreich's than in tabes.

The other type of ataxia which is present is only noticeable when the patient is at rest. It is seen to be a general affection, involving, as a rule, all of the muscles of the body. If looked at carefully every muscle will be seen to be in a state of unrest. It is apparently an effort on the part of the body to preserve its own equilibrium.

Upon the patient's making any voluntary effort both types of ataxia are illustrated, but the motor is so much the more prominent of the two that the static is often lost sight of.

A noticeable feature of the ataxia of this affection is that nature is doing a great deal to help—much more is this the case than in locomotor ataxia.

Cases I and II showed both types of ataxia to a marked degree. A point to be noticed is that the static type is much more evident when the patient is standing than when sitting.

2. *The deformities* characteristic of Friedreich's disease are of three kinds: the curvature of the spine, those affecting the foot, and those affecting the hand. The former two are by far the most common. Besides these several writers have recorded a dorsal flexion of all the toes, contractures of the hands and contractures of other muscles.

The usual condition of the spine is a lateral scoliosis, most pronounced in the cervical and lumbar regions. Soca considers it to be present in one-half of the cases. Griffith finds it only in fifty-seven out of 143. Hallion, who quotes this and who has made a careful study of the spinal curvature in nervous affections, concludes that the gray substance of the cord is affected in a different degree in each disease. In Friedreich's disease the pathological change is found in Clarke's columns.

The deformities of the foot have been usually the pes cavus or the talipes equinus. Occasionally there has been only a dorsal flexion of the toes, or, as in Rutimeyer's families, only an early prominence of the extensor proprius hallucis. These deformities are not essential to the correct diagnosis of the disease, but are none the less frequent enough to warrant being called characteristics of the disease.

Here I should mention the Friedreich foot.

There is a characteristic appearance to the foot, which is sufficiently common and occurs with enough frequency to warrant its being given a specific and more than passing notice. The foot is shorter than in health; the sole is hollowed out; the dorsal surface is very prominent and the toes are hyperextended. The hyperextension is more marked in the big toe than any of the others. The tendon of the extensor proprius hallucis is prominent. This latter characteristic added to the hollow foot accentuates the deformity. The foot then is contracted, hollowed, and with a very high instep, the toes are hyperextended. This is the most common and the most constant of the deformities; it occurs in a great many cases and is so well recognized as to be spoken of as the Friedreich foot.

3. *The Familial Trait.*

Friedreich's ataxia has often been spoken of as an hereditary ataxia and the idea has become prevalent that the disease with all its pathological and clinical manifestations can be handed down from father to son. The condition is hereditary only in the broadest sense of the word; in fact the use of the word hereditary in connection with Friedreich's ataxia is better omitted. There have been cases in which the disease was transmitted directly from parent to child, as in the cases of Bradbury, Brousse and Carre; Fowler reported a case in which the father had a peculiar gait, as did Botkin. Griffith analyzed this question and found only thirty-two cases in which there was direct evidence of an inheritance.

There are countless instances where either some form of ataxia or some other of many neuroses have been found in the ancestors. In this way there is established a neuropathic heredity or tendency, which in turn tends to transmit a nervous diathesis and so provides a soil suitable for the development of Friedreich's disease.

The better word to make use of in speaking of this disease

is the word "familial." This describes one of the characteristics of the condition. It means that the disease has a family character, that is, that there exists a tendency for the condition to occur in a family. This also must be taken in its broadest sense, for it means that not only is it likely to occur in several generations but also in several members of the same generation. The majority of the cases that have been reported have occurred in family groups; isolated cases have been reported. There is no doubt that these cases were genuine and that in isolated instances the disease does exist. That is, however, unusual. The rule is that the disease attacks more than one member of a family; so usual is this that the familial trait is symptomatic.

4. *The Loss of the Knee-jerk.*

As regards the presence or absence of the knee-jerk in Friedreich's ataxia there seems to be some difference of opinion. In the large majority of instances the knee-jerk is abolished. It is undoubtedly true that many of the cases reported as being cases of Friedreich's with present or even exaggerated reflexes are not genuine examples of the disease. Several cases with both conditions, however, have been reported and undoubtedly are genuine. The MacDonald children of Sinkler are undoubted cases, yet both have preserved the knee-jerk; Prince's case is genuine with an exaggerated reflex; Massalongo reported two cases, in one of whom this reflex was normal, in the other exaggerated. Crozier Griffith reported out of 143 cases, ninety-one only in whom the knee-jerk was abolished. He also has collected some undoubted cases in whom the reflex was not abolished. Tresidder reports an entire family in whom the diagnosis is beyond doubt; the knee-jerk is present in one of these. It is, therefore, true that in Friedreich's ataxia the knee-jerk may be present; one cannot in view of the facts which I have been able to collect agree with Ladame, who says, in "Brain," vol. xiii, 1890, p. 492, that the abolition of the knee-jerk is an absolute rule.

The conclusion which seems to me to be fair and reasonable is this: abolition of the knee-jerks in Friedreich's ataxia is a very important sign; it is found in the vast majority of cases; it is not, however, an infallible nor is it a necessary sign to establish the diagnosis. It should never be forgotten, as Westphal has very sagely remarked, that the knee-jerk will not be abolished unless there is an involvement of the lumbar enlargement.

5. *The Early Onset.*

The disease is one of childhood; on this there seems to be a fairly unanimous verdict. Friedreich stands alone as describing it as a condition developing at, or coincident with, puberty. It must be borne in mind that his opinion was based on the first few cases reported and those very few in number. Later observers have very decidedly cleared up this point. Giles de la Tourette reported three cases under eleven; Whyte three under fifteen; several a number at a much earlier age. A résumé of the cases shows that more than one-half began before the age of twelve. Gowers in his "Diseases of the Nervous System" gives "seven or eight" as the most common age. Starr says that "it usually begins from six to eight" and never after sixteen. Dana gives the age as from six to fifteen but adds that "it may come on after maturity." Williamson puts the age of onset as the "seventh or eighth year" and never after twenty-five. Charcot is said to have lectured on two cases in 1893 in whom the onset was twenty-one and twenty-five.

The fact that some cases have been reported as beginning in the twenties must be taken with a reservation; it should never be forgotten that statistics of age, based on the evidence of hospital and dispensary patients, cannot be regarded with any too great degree of accuracy. One would be disposed to question the accuracy of the statement that no symptoms of the disease had developed before the age of twenty-five, unless the patient for several years previous had been known to the physician.

It is then sufficiently proven to warrant a statement to this effect; the majority of cases develop in childhood, the disease is one of childhood, and, finally, one of the characteristics of Friedreich's ataxia is the early onset.

6. *Disturbance of Speech.*

In a large majority of the cases of Friedreich's ataxia there is present some disturbance of speech; it is a later symptom and for this reason is probably not more constant. Almost every writer on the subject alludes to it; it may vary between the two extremes of an almost imperceptible drawl to a very marked and almost unintelligible jargon. It has been described as "slow," "rapid," and "jerky." Friedreich called it the "ataxia of speech." To my mind the term that best fits it is the "scanning ataxic" speech. It is not dissimilar to the speech of the paretic and yet, on the other hand, bears a close resemblance to

the pure scanning speech of the patient with multiple sclerosis. The points which I wish to emphasize as regards the speech are twofold; one is that it is a common but late symptom, and the second is that it is of a very protean character.

In addition to the six characteristics which I have mentioned there are six other symptoms, which occur in Friedreich's ataxia with sufficient frequency to warrant their being mentioned in every review of this unusual condition. These are:

1. Nystagmus.
2. Disturbances of sensation.
3. Romberg's symptom.
4. Choreiform jerks.
5. Mental state.
6. Paralysis and contractures.

1. The nystagmus is a late manifestation; it has been reported as being present in more than half of the cases; no doubt it would be found in a much larger proportion were it not for the fact that the patients die of some intercurrent disease before they reach the stage at which the nystagmus develops. The character of the nystagmus is somewhat different from the regular or classic nystagmus found in multiple sclerosis; it is an inconstant and irregular type. Friedreich himself observed this and in describing it used the term "ataxic nystagmus." It has to be very carefully looked for. It is not rapid, less so than the ordinary nystagmus. Cases with static nystagmus have been reported and do occur; they are, however, rare. Therefore, before declaring that this symptom is absent, careful and numerous examinations should be made.

2. Disturbances of sensation are often found. Pain may be present but not the lancinating pain of tabes, rather the pain which is characteristic of any chronic affection. Different forms of disturbance of cutaneous sensibility have been reported covering all the different varieties—that is, diminution of acuteness, paresthesia, hyperesthesia and girdle sensation. Authorities on this differ much; it is, after all, not a very important matter. In one of my cases I found diminished sensation; in another no change whatever.

Three authorities, viz., Dejerine, Bramwell, and no less a person than Charcot, have reported instances of lightning pains precisely similar to those in locomotor ataxia.

On this symptom the literature and the facts are confusing

and conflicting. In conclusion, I should say that some form of sensory disturbance was present in almost every instance. It is not a symptom which throws much, if any, light on the disease and is of little practical aid.

3. Romberg's symptom is, of course, always present when the ataxia has reached a certain point and when the patient is in a condition where it is possible for him to stand.

4. Choreiform jerks are fairly common in the disease; they are not of constant or even ordinary occurrence. This will be realized when I point out that few of the text-books ever mention them. Neither Starr in his *Organic Nervous Diseases*, nor Dana in his text-book, speaks of them.

When they do occur, it is in the form of irregular twitchings with an irregular distribution—sometimes affecting the face and sometimes the extremities, sometimes both.

Whyte speaks of them as "an almost invariable part of the clinical picture of Friedreich's ataxia." Pitt regards them of almost equal importance. These statements, however, I regard as not wholly borne out by the literature or by my own personal observations. When they do occur, they are neither so violent nor so constant as the real choreiform movements.

In one of my cases I found them to be present to a very marked degree. The distribution was limited to the face and head. The patient presented the appearance of a child suffering from chorea. The muscular movements were finer and not quite so rapid as in chorea.

5. The mental condition of these patients is, as a rule, not altogether normal; most writers agree that the disease leaves the patient with a good deal of irritability and a certain amount of weak-mindedness. It seems fair to assume that any nervous disease which unfits a person for regular life will make him irritable and difficult to live with. Friedreich's ataxia, however, is particularly liable to render the victim irritable, retiring, and sensitive. This characteristic I found in one of my cases.

The fact that so many show a certain amount of weak-mindedness can, to a certain extent, be explained by the fact that the disease is one of childhood; it attacks the patient at a time when neither his education nor his mentality have developed to any extent; it at once curtails the one and blasts the other. This was very evident in one of my cases where the disease had begun at eight. As a result early in the teens the child had become a hopeless cripple. His education together with his contact and

association with others ceased; his mental development ceased; at eighteen he had the mind of a child of ten.

On the other hand, one of my cases had achieved a very high order of learning. She had become an instructor in a college. Another, an undoubted case, spent his life teaching; in spite of his condition, he attended lectures and met classes and traveled about. The mental condition is doubtless to a very great extent, due to the home surroundings and to the financial condition in which these patients find themselves.

6. The paralyses and contractures are the last symptoms of all which occur. They are rarely found until the disease has lasted ten or fifteen years. They usher in the terminal stage and as a rule involve the lower extremities more than the upper. They are a very constant symptom.

CASE I.—The patient was the youngest of seven; the eldest had died in infancy; the second had developed in the early twenties a condition of marked ataxia and had been told that he was suffering from hereditary ataxia. The next four were normal in every way; they had no signs of any nervous affection; were strong and healthy. The case here reported had been perfectly well and was in no sense a weak or nervous girl up to the age of twenty-three. At that age she began to notice difficulty in walking and an uncertainty in standing. This gradually increased; the same condition manifested itself in her arms and hands; she wrote with difficulty and used her fingers clumsily in regard to dressing and sewing. This gradually increased. At twenty-seven she consulted me.

Present Condition.—There is a slight asymmetry of the face. The pupils are in every respect normal; there is no nystagmus. There is no tremor of either the tongue or face. There is present both static and motor ataxia. The gait is very ataxic with a swaying motion. She sways on standing; the Romberg symptom is present. The ataxia involves all four extremities; it is made more evident upon the patient's attempting any voluntary motion.

The reflexes of the pupil, the epigastric and the abdominal reflexes are all present and normal. There is no ankle clonus and no Babinski.

The knee-jerks are absent; the Achilles jerks are absent; the plantar reflex is present on the left but absent on the right.

There is slight atrophy of the left side of the face and a questionable atrophy of the interossei muscles of both hands.

There is a peculiar affection of the speech; it is not scanning but it is rather of a halting or jerky nature. Neither the patient nor her family have ever noticed this. When brought to their attention they admit its being present but regard it as congenital.

The patient shows no choreiform movements, no contractures, no atrophy of lower extremities.

Electrical examination not made.

The spinal column is not straight; it shows a tendency to lean in the cervical region to the right, in the lumbar to the left; in other words, it describes the figure 2. The patient in sitting leans forward and constantly to the right.

The feet in repose show a very high instep with a prominence of the dorsum and a curve of the sole more marked than normal. When the patient stands there is no deformity evident. The feet are of the same size and each have high extension.

There is no muscular weakness evident. The patient tires very easily and especially after any prolonged effort or walk.

There is an undoubted difference to cutaneous sensibility on the two sides. This extends over the entire body, so that the appreciation of touch is much more marked on the left than the right.

There are no bladder symptoms.

The intelligence of the patient is very considerable; she is somewhat more easily annoyed and more irritable than formerly; she is also somewhat emotional.

CASE II.—The patient was the second of four; the other three, two brothers and a sister, were normal, although the youngest was only six and therefore still too young to eliminate. All three were free in every sense from any nervous disorder. The mother was a healthy and normal woman of German descent. She said that she had had neither brother nor sister, several having died during infancy. Her parents she knew to be strong and healthy German peasants, and so far as she knew the ancestry back of them was good stock, strong, robust, of the German peasant type. The father of the patient had died some years before. The wife knew little about her husband's family; they came from Germany, and so far as she knew the ancestry was like hers—of good German peasant blood. The father himself had died of a bad cold, and had been addicted to alcoholic excesses.

Present Condition.—At the age of eight, or just ten years ago, the boy had begun to notice that he experienced difficulty in walking. This steadily and rapidly increased, especially so in the last year until he had reached the condition in which I saw him—one of almost complete paralysis. He could not walk except by holding on to something. The ataxia was very great. It was of both types, the static and the motor. The distribution was general as it involved all four extremities, and to a certain extent the head. There was no tremor. There were marked choreiform movements affecting the upper extremities and especially affecting the muscles of the face. There were no tremors. There was no atrophy. There was no disturbance of the sphincters.

Nystagmus was evident to a slight degree; otherwise the pupils were normal, in size and reaction.

The knee-jerks were absent, as were the plantar reflexes; the superficial reflexes were present. There was no Babinski, no ankle clonus.

The feet were considerably deformed from years of invalidism. They, however, showed the typical "Friedreich foot." There was a prominence of the dorsum, a hollowing of the foot, and a hyperextension of the great toe.

There was a marked lateral scoliosis to the left so that the patient leaned way over.

There were no disturbances of the cutaneous sensibilities; there were no contractures.

There were no deformities in the hands; they were, however, cold, congested. There was evident in the hands a condition of slight atrophy affecting the interossei muscles.

The speech was very decidedly affected; it was classic, showing both the scanning and the ataxic qualities.

The mental condition when one takes into consideration the fact that the boy had been an invalid for ten years was fair.

The case then was a straightforward one; it showed the spinal deformity, the typical foot, the absence of knee-jerks, and the ataxia. It occurred at an early age. It lacked the familial trait.

CASE III.—The patient is the eldest of three—all girls. The parents are both strong and healthy; they are Russian peasants and had lived in the outskirts of a small Russian town. Neither is alcoholic. They know of no similar condition among their ancestors. The father had five brothers and sisters. The mother is a fine looking woman and said she was one of ten; that all her brothers had served in the army, and that her husband's family were equally strong.

This child had a perfectly normal birth and during the pregnancy everything had gone along in a perfectly straightforward way. She had some difficulty in learning to walk but nothing was thought of it until she reached the age of five when it became apparent that the child could only walk with difficulty. The condition seemed to get worse each year. When I saw her she was eleven.

Present Condition.—The girl is bright-looking, a little undersized. She has a distinct spinal curvature, which upon examination proved to be a typical lateral scoliosis with the convexity in the dorsal region to the right. The pupils are in every respect normal; there is no nystagmus. There is no facial asymmetry and no tremor anywhere. There are, however, very marked and general choreiform movements involving the entire body as well as the face. There is both static and motor ataxia. She can walk only by holding on to something. The gait is very ataxic. Both knee-jerks are absent. There is a marked Romberg present. The mental condition is a little backward

but not very; superficially it seems to be good but her teachers say she is a little backward. There are no contractures, no paralysis, no sensory disturbances of any kind. There is no ankle clonus. There is no Babinski. Plantar reflex is absent. The speech is not normal and the mother said that it was not as clear as it had been in the past. The superficial reflexes are present. No atrophy. Sphincters normal.

The feet are very interesting and typical. The right foot is a little smaller than normal and somewhat contracted. At time the toes present—and this is especially true of the toes of the left foot—the deformity which is characteristic of this disease and to which has been given the name of hammer toe. The instep is very high; the arch is accentuated and the foot is hollowed out. The whole foot is shorter and smaller than the normal. The left foot is more involved than the right. The condition seems to be well established in the left, only beginning in the right.

There are no deformities in the hands.

The case then is a classical one; it well illustrates the ataxia, the deformities of both spine and foot, the choreiform movements, and the occurrence at an early age. It also shows the familial trait, as you will see when you examine the next patient.

CASE IV.—This patient is the sister of the case which I have just shown. She is three and one-half years old. The history of her infancy and of the pregnancy as well as of the labor is absolutely normal; if anything, more so than of the elder sister. The mother considered this child as stronger and brighter than the elder. Nothing out of the way was ever noticed until it became time for her to walk. She was a little backward and did not walk quite as well as other children. The condition gradually grew worse. When she was three years of age it was very noticeable. And to-day she is very ataxic and walks with great difficulty.

The examination of this child reveals nothing abnormal unless it is the appearance of the feet. It is just possible that there is a beginning prominence of the tendon of the extensor proprius hallucis. And perhaps the foot is a little suggestive of the sister's. There is nothing else.

This case is very interesting and very unusual for three reasons. First, because the patient presents only one physical sign, but presents that one to so marked a degree. She is very ataxic. Second, because of the appearance of any symptom at so early an age, I mean of any symptom of Friedreich's ataxia; and, third, she is interesting because of the fact that her sister has Friedreich's disease.

This baby then illustrates two of the six important characteristics of this condition—the ataxia and the familial trait.

I think it can be said beyond any reasonable doubt that this little child is developing Friedreich's ataxia.

There is a third child in this family. She is only two and a

half. So far she has shown nothing out of the ordinary. I shall watch her with considerable interest.

The cause of the disease is really the most important factor connected with it. It is apparently a congenital condition, a defective development of certain portions of the cerebro-spinal axes. It is due to their faulty development and not to heredity. The sclerosis and degeneration readily starts and as readily progresses.

The cause of this faulty development of nerve tissue is obscure. It is, however, hereditary and transmissible. In a majority of the cases reported an ataxic history can be proved. Neither syphilis nor tuberculosis can be found to be etiological factors. Griffith has reported a few cases as occurring from consanguineous marriages. The real reason, however, for these cases doubtless lies in the presence of defective heredity. So far as I have been able to discover there is no one factor; the disease occurs in families who have bad nerve tissue. If any one condition can be regarded as a factor it is alcoholism, as in a large majority of the cases reported a history of alcohol in an ancestor has been recorded.

Case II, which I have reported, gave an alcoholic history. Friedreich found intemperance present in six of his nine cases. Griffith reported it in thirty-one.

The course of the disease is progressive. It is slow, it begins in childhood and, as a rule, takes from ten to fifteen years to incapacitate the patient. This rate of progress then becomes more slow and results eventually in paralysis, great weakness, and total disability. These children may live several years. Death usually comes as the result of intercurrent affections to which the patient is peculiarly liable and against which he has but feeble powers of resistance. Griffith says that many patients are able to follow their avocations for years; long life, however, is not characteristic of Friedreich's ataxia. The longest duration reported is one of Vizioli's patients who died at the age of forty-six. The large majority, however, succumb in the late twenties or very early thirties.

Differential diagnosis is to be made between tabes dorsalis, simple sclerosis, ataxic paraplegia, cerebellar disease, hereditary cerebellar ataxia, and the choreas.

The pathology of the condition is hardly one which ought to be considered in an article of this kind. In the few autopsies, however, which have been made, the conditions reported in brief

have been as follows: The cord has in every instance been found atrophic and small in both size and shape. There has been a sclerosis of the posterior columns and a sclerosis and degeneration of the direct cerebellar tracts, the columns of Clarke, and the anterior pyramidal tracts. These conditions have varied in the different cases, but as Griffith says, the evidence is strongly in favor of the view that Friedreich's ataxia is a combined systemic spinal disease, at least for certain parts of the cord.

The unusual characteristics of the cases which I have reported are as follows:

Case I shows very marked mental capacity. Several attempts have been made by this patient to trace back any defect in her heredity. They failed absolutely, although she was able to go back five or six generations. There was no defective heredity, bad nerve tissue, no alcoholism, no tuberculosis in her ancestry.

Case II is an unusual one because it is an isolated one with several brothers and sisters. There is no other case in the family. Case V is unusual because of its early appearance, the child being only two and a half years; it is also unusual because the child has but one symptom, a very marked ataxia.

The earlier symptoms of the disease are the ataxic gait, the loss of knee-jerks and the choreiform movements. The late symptoms are a nystagmus, the paralyses and contractures.

54 WEST FIFTIETH STREET.

THE EXCEPTIONALLY BRIGHT CHILD.*

BY
MAXIMILIAN P. E. GROSZMANN.

OF exceptionally bright children, there are two classes: the pathological and the nonpathological. The latter class exhibits merely a more rapid rhythm in the rate of physical and mental development, and the children belonging to this class are otherwise perfectly balanced and sound. As long as the equilibrium of mental and physical growth is maintained, children of this type can be safely allowed to go on in school training after their own individual fashion and rate. A number of special plans have been devised to meet the conditions of such exceptionally

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rapid rate of growth so as to break the monotony of the graded system; each has its own particular excellency.

But even these nonpathological cases may at times, especially at certain growth periods, for example at the time of puberty, develop the tension symptoms which would indicate a degree of disparity between nerve and muscle growth, between the stages of central and peripheral development, between the size and function of certain organs, that danger of derailment is imminent. It will therefore be commendable to watch the physical health of these children at all stages with particular care, and to make promotion, and even continuance in school, dependent upon a clean health record.

Much depends also upon the kind of stock from which such a child has sprung; a virile heredity is a good promise of wholesome development. There are many "promising pupils" who never do the extraordinary things when they grow up which were expected of them. With some it was merely a matter of a good memory during the years of school life; with others, of social circumstances. A fortunate combination of social conditions may favor the mediocre mind at the expense of one more gifted. Who will tell how many really exceptional children with fine mental endowments are lost to the world through lack of opportunity?

The second class of exceptionally bright children is essentially pathological. While the first class represents simply an acceleration of otherwise typical development, the latter exhibits atypical and even abnormal symptoms of growth, with excessive variations and surprising manifestations, such as are found only in rare individuals. The pathological class comprises the genius, the "Wunderkind," and the "idiot-savant."

Speaking of the last-named class first, we observe here the strange fact that an individual exhibits the most prodigious ability in a certain well-circumscribed field of activity, while all other fields are underdeveloped. Musical prodigies and lightning calculators of this type are otherwise clearly idiotic and feeble-minded, and their special gift appears to be the result of a mechanical process in the brain which has no significance for the intellectual value of the individual. The very facility of a man like Inaudi to give immediate answers to extremely complex mathematical problems with large rows of figures eliminates conscious thought and judgment entirely, and places him in the class of freaks of nature. Such persons are mere living calculating

machines. The study of these cases has no other educational or scientific value than that it may throw light upon certain mechanical processes in the central nervous system.

The class to which the German term "Wunderkinder" has been applied develops marvelous excellency without completely destroying the balance of the mind. Genius represents the most brilliant type of this order and is a "Wunderkind" grown up. But most such persons show brilliancy in one direction only while in all others there is but ordinary efficiency. A universal genius on the order of Michael Angelo is extremely rare and can be developed and sustained only when a person is also endowed with perfect physical health.

Dr. Paul Carus says about the genius ("Our Children," p. 154): "The soul of a genius consists of motor ideas which are correct representations of things in the objective world and of the work to be performed. They interact without the laborious effort of conscious concentration. They act with machine-like accuracy, so as to allow attention to be concentrated upon the main purpose of the work and not upon its details. A genius originates partly by inheriting a disposition for easily acquiring certain functions, or generally by possessing the knack of viewing the world correctly. Whatever may be the cause of genius, it certainly shows itself in the playful ease with which work of great importance is performed. . . . Genius is instinct on a higher plane." This would seem to show a relationship between the genius and the idiot-savant inasmuch as there is the mechanical element in the make-up of both. There is more of the instinctive impulse than of conscious application. And it should be noted that Carus recognizes the part which motor ideas play in the constitution of the genius, a fact to which reference will be made later.

What this mechanical element is may become clearer from a report recently published ("Zeitschrift für Kinderforschung," Langensalza, March, 1910) on one Otto Pöhler, the early reader of Braunschweig. He began to read letters, words, and figures at the tender age of one and a quarter years. The case of this boy, who is now nearly seventeen, has been carefully studied, and cranial measurements have been taken. It appeared that when he was a child his occipital bone was unusually prominent, and the axes of the eyes were farther apart than in average children. Dr. Oswald Berkhan comments as follows: "Prof. Hermann Munk has shown that the convolutions of the hind-

brain have a close connection with the visual function, and that in this region (he calls it the visual spheres—"Sehephären") those perceptions which were obtained from the optic nerves are stored up as memory images. It is therefore not improbable that the prominent occipital bone corresponds with a stronger and more deeply convoluted hind-brain, the center of the optic images of written and printed symbols, *i.e.*, of the memory images of the words read. And the relatively greater distance of the eye-axes permits of the assumption that there is an extraordinary arrangement of the convolutions of the fore-brain."

This indicates that at the bottom of the boy's exceptional ability to read, and later on to acquire foreign languages, history, etc., was an exceptional visual perception and *memory*, based upon a special anatomical endowment. An exceptional and quickly acting memory will explain many otherwise strange phenomena in the manifestations of these "Wunderkinder," and let it also be remembered that this memory is intimately connected with the corresponding motor impulses. It is essentially a matter of motor ideas as Carus put it.

The early faculty in Otto Pöhler to *read* figures was not accompanied by a corresponding ability to compute, showing it to be in the nature of a mechanical facility. The boy is now, at this writing, an intelligent young man, endowed with an admirable memory, well educated, pleasant of manner, who is always ready to find his proper place. Otherwise there is nothing remarkable about him, although he promises to become a very successful student of history. The anatomical peculiarities spoken of before are less marked in the youth than they were in the boy.

The only pathological symptom reported in this case when his precocious reading faculty was most marked, in his childhood years, was a tendency to stutter and to have spastic movements of the muscles of the mouth.

Very different is the character-picture of another type of "Wunderkinder," the artistic type. Take the musical genius, Wolfgang Amadäus Mozart, for an example. Mozart showed remarkable musical ability at three years of age. But he was never a well-balanced personality. He was impulsive, careless, erratic, a very poor manager. His irresponsibility in money matters, his happy-go-lucky way, caused him to be always in want. Toward the time of his early decline, when he had exhausted his opportunities and nerve force in a spendthrift sort of way, he became morbid and died at the early age of thirty-five.

His was clearly a pathological case. Not all exceptional minds end so ingloriously and early. Prof. Francis Galton says: "Early manifestations of genius are not incompatible with prolonged and even late development. Haydn, Beethoven, Michael Angelo, Milton, Goethe, Voltaire, Newton, and others are examples of lengthy process of development. Men of great original power may be expected to illustrate the most prolonged movement of mental growth."

Nevertheless, the danger of pathological tension is ever present, and too much care cannot be exercised in watching over these developments, as we shall see later.

The mathematical prodigy is another type. Michael Angelo, in a measure, belonged to this type, and certainly Gauss and Newton. With the mathematical ability is often coupled a high degree of effectiveness in the exact sciences.

The modern "Wunderkind" of this class is William James Sidis, the eleven-year-old boy who addressed Harvard professors on the problem of the fourth dimension. I have not been favored by the father, Prof. Boris Sidis, to whom I addressed myself some months ago, with any direct data; thus I must rely upon the reports in the press.

That the young mathematician is warped somewhere in his mental make-up is evidenced by his egotistic tendency. One day he remarked: "I wonder whether school children in future generations will celebrate this as a holiday because it was the day on which I begun the study of the physical sciences." (!)

In spite of his big "I" he is certainly a remarkable child. In some respects he reminds one of Otto Pöhler. He was an early reader, had a great interest in words and figures, and had mastered five foreign languages at the age of eight. He has studied anatomy and astronomy. But his main capacity seems to be mathematical.

No cranial measurements are reported, but it is probable that the explanations given for the Pöhler case hold good in his, and it remains to be seen what William James Sidis will be at the age of seventeen.

The father claims that his boy's remarkable manifestations are the results of an educational system of his own. He availed himself of the opportunity of every newly awakening interest, and states that much more intense work can be done by every child if a more rational use were made of what has been called

"second breath," or "second wind," and by Prof. Wm. James, "reserve mental energy."

The contention is justifiable in a measure. Each child has budding or "nascent" periods for different forms of mental manifestations. The early years are the ones in which the naming, the language-making, the counting, the computing instincts arise, and in which a wealth of more or less conscious observations and experiments are made and stored up in the form of mental images and dormant impulses. These facts, however, well known to some, are yet too little understood and hardly recognized in practice. It is perfectly possible to assume that we might succeed in developing all our children to undreamed-of mental alertness and efficiency if proper use were made of these budding interests before they evaporate, and if a careful training of the attention were attempted alongside with proper methods of teaching the child at the right time. It is really in many ways a matter of the proper method at the proper time. Carus is right when he says (*loc. cit.*): "The impressions of children who, in a certain line of activity, see nothing but the right methods from their very babyhood will be so organized that from their unconscious depths up to the conscious surface of their soul, they will be predetermined to hit naturally the right mode of action. . . . The condition of genius is a ready and automatic interaction of a sufficient number of clear and correct thought images, or representative pictures, which must be brought under the control of a guiding purpose."

Prof. David Edgar Rice, of Columbia University, thinks that the Sidis child's achievements are due to suggestion. "There seems to be scarcely any limit to the power of suggestion, and it is conceivable that by some process the father has been able to stimulate the natural powers of the child's mind to an extraordinary degree." This is very possible indeed, and it may be urged that a well-balanced suggestive method in education is most commendable in all cases, not only when there be the need of counteracting perverse or morbid dispositions. Suggestion has a very positive value.

Further, the theory that we can do much more intense and sustained work by calling upon our "second breath" is thoroughly tenable. As a rule, we allow a premature fatigue to interfere with the activity of our children, a fatigue which is not seldom manufactured by tedious and unscientific methods of teaching and unhygienic conditions. We do not work the children

intensely enough. The most effective man in the world is he who overcomes the torpidity of ready fatigue. Drawing upon our hidden strength, we develop latent possibilities and bring into activity those brain cells and thought and motor centers which lie dormant and which are in danger of remaining undeveloped. The number of brain cells functionally active is difficult to determine; but it is safe enough to say that it comprises only a fraction of the entire number of cells many of which remain forever immature. Who will venture to deny the possibility that by proper stimulation we may vastly increase the number of functioning cells, and thus of the potentialities of thought and motor activity?

And by proper methods of stimulation, the association passages from cell to cell will be multiplied, organized and worked smooth so that there would be a corresponding increment of mental power and rational judgment.

To what extent our subconscious self may become correlated with our conscious life, so that a vast area of occult organized mentality would be brought into rational coordination, is a matter of speculation. The problem, vast in its possibilities, may here merely be broached.

Let us also be reminded, in discussing the conditions of rapid growth, that space and time are mere abstractions or methods of conception. Both are motor concepts, and depend upon rhythmic elements of variable rate. Our mind, under certain stimuli, defies "time." Many are the experiences, in our dream life, or under the stress of great excitement, when we live through apparently long periods of time in the space of a single moment. Time as well as space are relative standards.

We may look further for an anatomical explanation of special gifts. Quoting from Church-Peterson's work on *Nervous and Mental Diseases* (p. 159, f.): "As a working scheme we may consider that motion is represented in three levels: First, in the gray matter of the spinal cord; second, in the Rolandic area of the cortex; third, in the highest levels of conscious thought, probably in the frontal region of the brain. The spinal level may be considered that of reflex, vegetative automatism, the Rolandic level that of motor memories, and the frontal area that of conscious, selective, and intelligent action. Thus, destruction of the highest level leaves automatic and memory action practically unimpaired. . . . In the automatism of dementia the motor memories are likewise preserved. The mid-level, the

Rolandic region, may be destroyed, leaving consciousness of volitional motions and the will to execute them, but the memory of their muscular production is gone, and they default, as, for instance, in motor aphasia. If the lowest or spinal level be destroyed, the mind and the memory organ have lost their tool and peripheral paralysis obtains. There is no difficulty in conceiving certain cortical areas to be memory organs, as in the case of the higher visual centers in the parietal lobe. We may, however, go further. All thought contains the two ideas of motion and sensation. They cannot be separated, and without them consciousness is impossible. Indeed, they are in a certain sense identical. Motion is to the mind but the sensation of a change of position, and sensation is only the recognition of arrested motion. If, then, we consider the parietal convolutions as visual memory depots, we are equally at liberty to consider the Rolandic areas as motor memory depots. . . . In the spinal levels single muscles or groups of muscles are represented. In the motor cortex coordinate and functionally associated movement memories are located, and in the highest level resides their volitional control and the power to recall and select them."

The authors here consider pathological effects from impairments of one or the other of these levels. But it is equally simple to conceive that one or the other be unusually well established and developed, well organized and well trained. We may thus easily deduct consequent special gifts such as have been described in the foregoing. And if the localization of functions as given by Church and Peterson should differ in some details from the contentions of Prof. Munk, cited before, they agree in the main position that we are dealing with motor memories.

Specially favorable conditions of growth, through nutrition and other environmental causes, enter into the process. There are also congenital and hereditary causes, such as race peculiarities, favorable mixture of types in the parents, reverberations of ancestral excellencies, etc.

Thus it would seem that after all we are discussing perfectly normal processes, and that we have no right to assume pathological deviations. It is certainly conceivable that under favorable circumstances exceptional excellence, genius, and precocity may appear without detriment to the individual.

Yet many factors enter into these exceptional life conditions which are difficult or impossible of control. The hereditary and

ethnic factors have already been alluded to, and will be again mentioned. If a virile stock is a favorable predisposing element, a weak heredity forms a hollow foundation for precocious development, and a "mortgaged inheritance" of biological elements will burden the debit side of the life ledger disastrously. The majority of all cases of genius and brilliancy will show neuropathic tension and health danger somewhere. Drawing upon the "second breath" too freely may become a habit so that the reserve force is exhausted for cases of emergencies. Barr (*Mental Defectives*, p. 125) intimates that backwardness and precocity in early childhood are related and are equally indicative of an abnormal ego. After all, each stage of growth has its distinct function, and it is well that we be sure to give each stage its fullness of opportunity even though we may admit that rate and rhythm differ in individuals.

An artificial stimulation and insistence upon overprecision in early childhood, may, as Stanley Hall shows, produce arrest of development; if we, for instance, expect too much of finer muscular adjustment in the young child, chorea is often the result. The same author says ("*Adolescence*," I, 321, ff): "Among the chief external causes of diseases at this age (adolescent age) are all those influences which tend to precocity, *e.g.*, city life with its earlier puberty, higher death rate, wider range and greater superficiality of knowledge, observations of vice and enhanced temptation, lessened repose, incessant distraction, more impure air, greater liability to contagion, and absence of the sanifying influences and repose of nature in country life. At its best, metropolitan life is hard on childhood and especially so on pubescents. . . . Civilization with all its accumulated mass of cultures and skills, its artifacts, its necessity of longer and severer apprenticeship and specialization, is ever harder on adolescents. . . . When we add to these predisposing causes the small and decreasing families, the later marriages, so that more and more are born of postmature parents and thus physiologically tend to precocity; the overnurture of only children who are so prone to be spoiled and ripened still earlier by unwise fondness; the mixture of distinct ethnic stocks that increase the ferments of adolescence by multiplying the factors of heredity and so increasing its instability, we no longer wonder that many in these most vulnerable years make more or less complete shipwrecks at every stage of these hothouse demands which in the entire life of our race are so recent. Under these

provocations, some instincts spring into activity with a suddenness that is almost explosive, and so prematurely, that as, *e.g.*, with sex and drink, the strong and complex psychic mechanism of control has no time to develop and forbidden pleasures are tasted to satiety, till the soul has sometimes not only lost its innocence before it understood what purity and virtue really mean, but life is blasé, a burnt-out cinder, admiration, enthusiasm, and high ambitions are weakened or gone, and the soul is tainted with indifference or discouragement."

After all, normal growth is a process of *maturing*.

Any warping of this process, any excessive growth in some particular direction, especially in the line of specific intellectual activity, is apt to produce an unbalancing of the moral equilibrium. This is the reason why genius is often characterized by extreme self-centeredness and even selfishness, by a tendency toward cruelty and sexual license.

And, although this paper is not particularly concerned in methods for alleviating exceptional conditions of this kind, a suggestion may not be amiss. If it is true that the basis of these conditions is to be found in an excessive development of the motor centers within a certain limited area, the danger may be counterbalanced by educative methods which will stimulate the motor centers in other areas. This is the reason why in the educational treatment of these cases manual training and physical exercise, a greater attention to the larger muscular activity, play such an important rôle. A toning up of the nervous system, rational and hygienic life conditions, organized exercises in the training of the powers of inhibition and voluntary control, and much positive, wholesome suggestion will do much toward saving these children from the unhappiness and nervous bankruptcy to which they are so often foredoomed.

Some who have had the experience of precocious development in their own early youth, may testify to the severe penalties they have had to pay. Even when intense activity was long sustained, intermittent periods of emotional explosions and disintegration, of neurasthenic tension and collapse, were frequent enough, and the danger of eccentricity and permanent derailment ever present. There were little need of the great number of sanatoria with which our country is blessed, had not the conditions of our life fostered a perilous tendency toward precocity and nervous overstimulation. And many a genius has, in his overstrung and hypersensitive soul, borne the burden

of human woes, sacrificing his happiness for the cursed gift of the gods. At its best, genius implies resignation:

"Genius and its rewards are briefly told:
A liberal nature and a niggard doom,
A difficult journey to a splendid tomb."

Forster.

THE DIFFERENCES BETWEEN ANATOMIC, PHYSIOLOGICAL, PSYCHOLOGICAL AND CHRONOLOGICAL AGE AS CAUSES OF DERAILMENT.*

BY

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WE are about to begin a complete readjustment in our methods of caring for the child in medical, social, and scholastic ways. We are unconsciously beginning this revolution by assuming a critical attitude toward our general practice of classifying all children on a basis of chronological age—the number of years which they have lived. The readjustment when complete will provide a new basis for record, investigation, and treatment of all kinds, and this basis will be the physiological or psychological age.

Definitions.—Physiological age refers to the stage of development which the child has reached, in contradistinction to the chronological age, which merely states the number of years which it has lived.

The term anatomic age is not in practice to be distinguished from physiological age; in fact, the drawing of any such distinction is merely to quibble. We may, it is true, assign a child to a certain group which corresponds to the first appearance of a new structure and call it anatomic age. Nevertheless, new structures do not appear without immediately assuming their proper function and the term physiological age seems to cover the ground.

Psychological age, however, refers to the status of the development of the mind, and we have ample justification in assigning to psychological developmental groups, based upon the appearance of a new mental function, such as the appearance of a desire

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to play team games instead of individual games, or to remember things by association rather than by rote.

Developmental Periods.—Intrauterine growth is extremely rapid; after birth it is followed by a rapidly decreasing rate of growth and development, until at the age of two or three the child begins to grow at a slowly increasing rate until a plateau of almost no growth and development is reached at about the chronological age of seven or eight. This static condition is maintained until there has commenced the great pubertal age. At this time, the most important epoch of adult life, second only in significance to the event of birth, the child commences a period which can only be likened to an explosion of growth and development. He begins to grow tall with great rapidity, weight is added pound by pound, and with the increased bulk comes a rapid addition to the muscle, strength, and motor ability. This age is most prone to occur during the warm months of the summer, and when it does occur a single month may add an inch in height, twenty pounds in weight, and double the muscle force. After a variable length of time, a year, or a year and a half, the increase in height, weight, and strength gradually return to a slower rate and the body and mind proceed with a stage of ripening which we call adolescence.

Referring to the whole progress from birth to maturity, we can catalogue the appearance of each new added structure, function, and mental ability, the latter forming a complete series from start to finish. Nor need we end our catalogue with maturity, for even on this high plateau appear new physical features and mental traits which determine important epochs in human life; even after this the downward slope of existence shows salient points, such as menopause, canities, and tissue hardening, which are physiological stages of exceeding definiteness and importance.

In this catalogue of events physiological and mental growth do not proceed in an orderly fashion year by year. Some may be hurried, others retarded. Individuals rush past others for a time and then lag behind, while nations seem to develop rapidly up to a certain point and then fall back behind others of steadier growth.

We cannot tell from the number of years which the individual has lived what stage of development he may be in. The calendar and the chronological age based upon it do not give us trustworthy information; and, strange to contemplate, the general

error of science, medicine and education is a stupid adherence to a chronological age.

Education.—There are two courses of study which the growing child must pursue, one of which is demanded by nature, the other by the school. The school cares for its own while nature's work is left to instinct and accident. Civilization demands reading, writing, arithmetic for its own maintenance and progress. Its business must be lubricated by the oil of this knowledge without which its processes would be impossible. Civilization provides schoolmasters to do the work of teaching and has rested content while the schoolmaster has made progress particular by making courses of study and devising ways and means to fit the child to the course.

Nature's course of study is as old as the shape of the bones and the form of the hand. It prepared for life while it insured the process of living. It adapted function to structure and structure to function—it made a man fit to live, to beget his kind, and transmit his prowess to generations uncounted. The schoolmaster was instinct, the experience of successful ancestors, and as the bodies developed the schoolmasters became many and changed, teaching for a while, departing when their work was done and when experience and knowledge took their place.

The masters of the schools of to-day are prone to forget that in the procession of "nature's schoolmasters" the instincts are far more potent than the exigencies of man-made requirements of the civilized group. On the whole, the gradual ripening of the child from birth to maturity has been recognized, and courses of study have been adapted to the average development of successive ages.

The particular periods when instincts appear have (in small part) been noted, and appropriate instruction has in the main been provided, but the great failure of education to-day is its inability to recognize the fact (where it is absolutely essential that it should) that children differ in rapidity of development. Its maladjustments are particularly evidently distressing at or about the time of puberty. The change from an asexual to a sexual life may occur at any age from six to twenty years, usually between twelve and fifteen, but when it does occur the changes are profound. In the short space of six months the child becomes a man or a woman, and the process is fraught with the dangers and turmoil of a new birth. There is an outburst of physical growth, 4 to 5 inches are added to height, 30 to 40 pounds

to weight, and strength may be doubled in a short space of time. New mental abilities appear while others disappear, the type of play changes, new companions are sought, new likings, tendencies, enthusiasms, and emotions make up the whole life. Old landmarks fade and new ones are eagerly sought.

The sexual ripening determines an entirely new outlook upon life, the earning instinct looms large in the boy and the home-making instinct in the girl.

The important fact that is constantly disregarded is the fact that the pubertal change leaves the child a wholly different being—different mentally, physically, morally, and ethically from the children in the stage just left behind.

This disregard results in the endeavor to teach classes that are composed of children of both prepubertal and the postpubertal stages, the immature and the mature.

Sitting alongside of each other, receiving the same teaching, subject to the same regulations and discipline, are children three or more years past puberty and others three or more years lacking before the change will occur. The result is a chaos. No one course of study can be fitted to their disparate needs and no one form of discipline can be enforced with each group with equal success.

This condition obtains in the whole of the grammar department of the elementary school and in the first year of the high school. It is particularly troublesome near the point of articulation of the two schools.

The elementary school commences theoretically at or about the age of six, when the child is able to go to and from school and has become a burden at home, which the head of the home, the mother, can shift to the shoulders of the public. The community on its part is glad to assume the burden for it must commence at the earliest possible moment to fit the child for citizenship. This lower school has for its opportunity the seven years immediately following, or rather it is the years up to the time when the child reaches its pubertal age. This is between the age (on an average) of thirteen or fourteen; hence, allowing for slow progress there will be about seven years for the elementary school. From ages of experiment it has been found that the child will not study in school after this epoch has been reached unless undue compulsion is used. The elementary school is naturally self-limited by the advent of puberty. Recently, however, the needs of education have been multiplied

and another year has been added to the elementary school, with the object that more may be taught. This disregard of natural limitation of the school produces the result outlined above. The postpubescent child is kept in the elementary school by force of will and authority, and, what is worse, he is subjected to the same treatment as the immature child.

Much of the teaching in the elementary school is based upon authority. The best teacher is often the one who can nag most successfully. The best pupil is the one who is most easily nagged and the one who would rather study his lessons than battle against odds with the school authority, in which he is handicapped beyond all chance of success. With this choice of rebellion or docility the postpubescent boy most often chooses according to his newly ripened instincts of manliness and becomes a school rebel and truant. Nothing could be worse for the child, the school, or society, for truancy is often the first term in a series of rebellions against organized authority, the last term of which is that in the penitentiary.

The mature boy is bound down to lessons in which he has no interest; his enthusiasms are those which are related to his suddenly increased mental and physical powers; these must receive an outlet; if they cannot in school they assuredly will out of doors if he is bound down to a dull routine of school fare at a time when he is beginning life anew and success is the most essential thing in life, and failure the most damaging. His immature brother may be four years older than he, is not worried or bothered with new abilities, and fits into the school routine which is frankly fitted to him. It is absurd to submit these two wholly different processes of individuals with entirely different elementary epochs to the same routine discipline, administration, and course of study.

It is clear that under the circumstances both the immature and the mature will suffer from being placed together in one classroom, and it is equally clear that the group to which the course of study is better adapted will suffer least.

While premises are granted, and they seem indisputable, the working out of this separation becomes the first immediate duty. Frequently this is in most cases very simple and will, moreover, entail absolutely no expense. For there are two or more processes in a scholastic grade and it is easy to determine by examination which are mature and which are immature and they can be readily placed in separate classes. Where there are

many classes of a grade we can have a definitely graded series of maturity and immaturity from a class of the most mature down to the class of the most immature. It will be strange indeed if our educational administration, once alive to the advantages of this plan, does not adopt it forthwith. Education will become rational, based upon what children are rather than what they are theoretically supposed to be.

Child Labor.—During the last twenty years there has been an organized movement toward the enactment of child-labor laws, and no legislation has been, on the whole, more beneficial to the child and the community at large. It has in the main protected the child from the strains of labor and conserved the health of the workers of this generation and has saved the lives of countless children.

These laws are, however, faulty and irrational, for they are based upon a chronological age. Immature children of fourteen are allowed to work, even though they will not become mature for two or three years afterward. Mature children under fourteen are not allowed to work even though they are strong young men and women who have passed the stage of puberty years before and are well ripened for the strains of life. This is manifestly absurd. The only rational procedure is to place the question of allowing children to labor or not upon the results of a physical examination which will determine their maturity or immaturity. The signs of puberty, pubescence in the male and menstruation in the female or more feasible pubescence in both, may be easier of determination, and, moreover, a proper criterion. Rotch of Boston has placed before the public recommendations to the effect that the appearance of ossification centers in the wrist should be used for this purpose. While this criterion would be important if it were true, it is unfortunately not true. Up to the present time, in the several bulletins issued by Dr. Rotch, there is unfortunately not a thread of evidence that the development of the bones of the wrist have related to them in any way any physical or mental ability of any kind, and not until this evidence has been presented can we in any way give attention or credence to the claims of this method.

Unfortunately also Dr. Rotch's development processes which cover about the stage of the appearance of puberty and labeled J, K, L and N, differ from each other only in the fact that they are the same as the previous stage only more so; that is to say, stage L differs from stage K only in the fact that the bones are

slowly more developed and more massed together. Unfortunately this is a matter of opinion that is not objective enough for scientific or practical purposes. Unfortunately, also, there is no particular reason why the bones of the wrist should be given preference to the bones of the ankle or any other convenient part of the body. This is particularly distressing for we have found that ossification does not proceed regularly throughout the body. There is even a difference between the right and left wrist, and if we were to follow Dr. Rotch's ideas we may be forced to put the left hand at work and to keep the right hand idle.

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ETHNIC FACTORS IN EDUCATION.*

BY

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IN these days of universal school system the difficulties of the educator have increased enormously. The manifold causes which are operative in the success or failure of the teacher enumerated in pedagogical literature almost invariably include ethnic factors with which the teacher is said to have to cope in his attempts to educate the citizen of the near future. Especially is this the case in the industrial centers of the United States where races from all parts of the habitable globe have come and made their home. Under our compulsory education laws the immigrant's children must be assimilated in the public schools if we are to make sure of avoiding the troubles of European countries in which the various races constitute a polyglot population and are a constant source of annoyance to good government. For this and many other reasons the ethnic or racial factor in education is worthy of consideration by an association for the study and education of exceptional children, and I am grateful to the president of this body for his invitation to address you on this subject.

The term "race" has been very much abused, especially by those who spoke of the aptitude for education of the different divisions of mankind. In this regard many have spoken of "inferior" as compared with "superior" or even "noble" races.

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The fact is that all the evidence accumulated by anthropologists during the last century has failed to determine a sharp line of demarcation between white, black, yellow, and red races of mankind, excepting, of course, that of pigmentation or color. However, when we consider those organs which are known to preside over the mental development of man, the nervous system, we do not know of any morphological peculiarities which can only be found in one division of mankind and are lacking in another. Thus, while it is probably true that the average weight of the negro brain is short by a few ounces when compared with the average weight of the brain of the white man, yet it must be conceded that this by no means brands him as an inferior. The average weight of the white woman's brain is also below that of the white man's brain, still very few will agree that woman as a human being is inferior. But even this difference in favor of the white man is not yet an established fact. While scientific literature contains data about 15,000 brains examined, we have observations of but several hundred negro brains. Some series, in fact, show that the average weight is about the same in the negro and the white man. Furthermore, it appears from all available data that about 60 per cent. of white people have brains which are not larger than the average negro brain, while about 30 per cent. have even smaller brains. To be sure, extremely large brains are more often found in white men, while extremely small brains are more often encountered in negroes. But the bulk of the population of both these divisions of mankind show but a slight difference, if any. If we agree that brain weight and intellectual capacity go hand in hand, which has not yet been proven, we might anticipate, as has been repeatedly pointed out by Professor Franz Boas, a lack of men of high genius among the colored people, but we cannot anticipate that the bulk of the negroes should prove inferior in their potential capacities for education, provided of course, they are given an equal chance to develop their faculties.

The suggestion made by some that it is not necessarily the weight of the brain which is the sole determining factor in the mental evolution of humanity, but the structure, the convolutions, the amount of gray matter, etc., are of more importance in this regard, may be true. But then it must be borne in mind that anatomically or morphologically there are no distinctive racial differences in the brains of different races of mankind. In other words, there are no morphological traits which are found

while examining the brain of a person of one race, but never found in the brain of a person of another race. No anatomist can tell with certainty by carefully examining a brain whether it is derived from a white, black, yellow, or red man. On the whole, in the present state of our knowledge of brain anatomy, we know very little about the morphology of the brain from the anthropological standpoint.

When the teacher inquires whether the differences in the aptitude for education observed in different peoples have an ethnic basis, there is but one answer, namely: From the study of the mental traits of the various races of mankind no differences could be elicited. Perhaps because of the slightly inferior weight of the negro brain fewer geniuses, recognized and unrecognized, may be expected among the colored people. I say perhaps, because even this has not yet been proven. We have not yet given the colored races the same opportunities in life as we have taken for ourselves. But we must bear in mind that only a hundred years ago it was thought that the negro was doomed to remain a savage and would never be able to uplift himself even as far as learning to read and write. About eighty years ago, John C. Calhoun said that if he met with a negro adept in Greek syntax he would concede that the negro is also a human being and ought to be treated as such. We know now many negroes who are excellent Greek scholars, but down in Carolina where Calhoun lived they still treat the negroes as if they were not human beings. That they can master the elementary branches and much more is now conceded by all. Indeed, an illiterate negro is considered to-day everywhere as one who has for one reason or another been denied an education, and not because he has a black skin.

Many have considered the autochthonous races of Australia as a yet lower grade of humanity than the African negro. The first settlers repeatedly and unhesitatingly declared that they could never be educated. This was mainly due to the fact that the white colonists were themselves not of a high order of intellect, and being unable to understand the language of the natives, they misjudged them. But it is now generally well known that many Australian blacks have been fairly well educated and that their potentialities in this direction are on a level, and they fully hold their own with their white school fellows. This has repeatedly been attested by such authorities on Australian races as Walter Roth, Baldwin, Spencer, Gillen, and Creed,

and is at present not questioned by anyone who knows conditions on that continent.

Some educators have maintained that not only are the colored races a problem to the teacher, but that in our large cities the cosmopolitan population, made up of the various white races and nationalities, presenting different peculiarities, all ascribed to that vague term "temperament," has increased the difficulties of the teacher. That there is little in this will be agreed by those teachers who have had opportunities to teach in various parts of the city of New York, or Chicago, Boston, etc. Eliminating for the present special causes, the results attained by competent teachers in the average classroom is about the same if social and economic conditions are taken into consideration. Indeed, the teacher who cannot show the same salutary results with Irish, Italian, Bohemian, Scotch, Jewish, and Chinese children, as with American children must blame himself and not attribute his failure to race influences. One illustration will suffice to make this point clear: Newspaper and magazine writers, settlement workers as well as teachers have often commented on the fact that the immigrant Jewish children on the east side of New York City excel in their studies; some even maintained that the "Jewish race" is superior in this regard. That this is not due to ethnic factors, but is mainly the result of special conditions both here and abroad in their native homes in eastern Europe is evident from the following facts. The average immigrant Jewish child is more exact and prompt in his attendance than the native child. When we recall that its parents, especially the mother, are invariably sober and devoted to their offspring, anxious to give them an education which was denied them in their native country, we suspect that it is not necessarily an inherent thirst for knowledge which brings this about. Among the poor of other creeds children are often neglected because their parents through shiftlessness or even drunkenness are not in position to prepare the children for school, and this is perhaps the most important cause of tardiness or absence. Then it must be borne in mind that the Jewish immigrant child only rarely indulges in the various games and sports of childhood which take away others from long and assiduous home study and reading. As a matter of fact Jewish children who in recent years have taken to games and sports are generally inferior as pupils, though superior physically. For the same reason the differences between the

immigrant Jewish child as compared with his native American co-religionist are striking. The former is superior in his studies, while the latter excels physically.

Generally speaking, the teacher cannot reasonably indulge in race theories and ascribe his inability to manage a class to ethnic factors, saying that the Latin southern races are excitable, emotional and occasionally unmanageable by an Anglo-Saxon; that the Jewish child is studious, attentive, but careless and untidy in his work. He must remember that while the pupil spends only twenty-five hours weekly in the schoolroom under the influence of uplifting surroundings, he is under the influence of a different, often adverse environment more than five times as long. The traditionally hereditary, but by no means biologically hereditary, habits and customs of life which dominate him outside of school, if judged by the length of exposure alone, are often sufficient to counteract any benefits derived from the teacher's influence, no matter what race the pupil is derived from.

Recent research has shown that the environment has a great influence on the ethnic type. It appears that races transplanted from southern or eastern Europe to New York City change physically in a remarkable manner. My own investigations prove conclusively that the descendants of immigrants are of superior physical development when compared with their parents or with people of the same race who remained at home.

Professor Boas' recent investigations of a very large number of immigrant children in New York City have shown more definitely that nature assimilates the immigrants, adapting them to their new environment. The descendants of the immigrants increase in height and weight, and even their head form approaches in type to that of the native American. The importance of this change cannot be overestimated and its significance for the educator is immense. It goes far to show that racial physical characteristics do not survive under the new social and climatic environment of the United States. This is the case with racial traits which before these investigations have been considered stable and persistent, transmitted by heredity under all kinds of conditions. But psychic and mental traits have always been known to change with changes in the environment, especially under the influence of education and example. Here, then, the teacher sees that his mission to assimilate the descendants of the immigrants is much simpler

than was once believed. Nature helps him by transforming the descendants of the immigrants physically, thus making it easier task to imbue the average pupil with the American spirit and make him a worthy citizen of the United States.

I am convinced that it is our excellent public-school system which is to be given credit for the fact that we have avoided the troubles of many European countries in which several races or nationalities live together. In Germany and Austria there are some even to-day who believe that a Pole will never learn any other language but Polish, mainly because he is of the Slavonic race. Austrian politicians maintain that the fifteen polyglot nationalities of that empire can never be made to speak German; Russia has used all means, not stopping at massacres, to induce the Jews to forget their mother-tongue, Yiddish; still 97 per cent. of them stated at the last census of that country that their language is not Russian. Compare this with conditions in the United States. Here the Pole, the Bohemian, the Italian, the German, the Frenchman, all do their best to learn English and very few teach their children to read and write any other language. In two generations the bulk of them know of but one mother-tongue, English. We have solved the problem of languages and to a great extent of races without coercion, without bloodshed, while European nations have found it impossible to attain this end by all cruel means, forgetting that education is more potent in this direction.

In the practical work of the teacher, especially in elemental schools, ethnic factors can be left out of consideration.

1337 MADISON AVE., N. Y.

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS WITH REPORT OF CASE.

BY

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THE pylorus is an aperture in the stomach through which the stomach contents pass into the duodenum. The circular muscle fibers are especially developed, producing the pyloric sphincter. On postmortem examination the pylorus is oval in form and resembles the os uteri.

Congenital hypertrophic stenosis is very rare. Many cases of

stenosis in infants have been reported, but the majority of them are simply due to functional spasm with symptoms of stenosis. In this paper I shall try to confine myself to the true hypertrophic congenital form.

Etiology.—Very little is known in regard to the true etiology of this condition. Many theories have been brought out, but as yet nothing definite in regard to etiology is known.

The first case of true congenital hypertrophic stenosis was described in 1897 by Thomson of Edinburgh. The condition is chiefly found in male children, nine cases out of ten occurring in boys. The age in which this condition is found is usually from birth up to four weeks. Family inheritance seems to play no account, although some authors think it occurs in those families which have stomach trouble. It is usually found in northern climates. No cause for this is given, except perhaps that it is recognized oftener in these countries.

The following are some of the hypotheses of the direct causes:

1. The hypertrophy may be a primary hypertrophy or new-growth because (a) the condition is found in the fetus. It has been found in a seven-months-old fetus. (b) Condition arises immediately after birth. The early onset is a proof of prenatal origin. (c) The associated muscle hypertrophy of the stomach is not a general hypertrophy of the whole organ.

2. It may be a secondary hypertrophy, not only of the pylorus, but of the rest of the stomach, due to hyperacidity causing a spasm of the pylorus. In breast-fed children, free acid is found in from one to one and one-half hours after eating, while with cow's milk, free acid is found in two hours. Miller and Wilcox, while experimenting with gastric secretion in infants, found that in pyloric spasm there was an increased acidity with normal ferment activity, while in hypertrophic stenosis the acidity caused milk to clot rapidly and firmly. Can a pyloric spasm give rise to a hypertrophy of the pylorus, causing a stenosis? There are many cases of spasm without hypertrophy. The pylorus normally is in a state of contraction, dilating to allow passage of stomach contents. May not amount of spasm be great enough to produce an excessive hypertrophy? We find this condition in every-day life where certain groups of muscles hypertrophy from excessive use. But will this hypothesis of hypertrophy from spasm hold good in those conditions found in the fetus? If so, what causes the primary spasm in the fetus?

3. A third hypothesis of the origin of pyloric stenosis is that it

is due to an incoordinate action of the stomach muscles from a functional disorder of the gastric nervous system, resulting in a gastric spasm with hypertrophy.

4. A fourth hypothesis is that at birth there is a predisposition to spasm with secondary hypertrophy due to an imperfect development of the nervous mechanism regulating gastric motility due to an increased demand on the stomach directly after birth.

Pathology.—The thickness of the pylorus is almost always due exclusively to hypertrophy of the circular muscular spincter. The tumor is hard like gristle, and cuts like the cartilage of the knee. It is easily felt through the abdominal wall. The muscular hypertrophy is not only at the pylorus, but throughout the body of the stomach. The stomach is enlarged and the mucous membrane is in state of chronic catarrh.

Symptoms.—As a rule, symptoms do not come on immediately after birth. The child may thrive for a short time. It begins vomiting one hour or more after eating. Sometimes it may retain the food for several feedings and then vomit the entire amount. The child loses weight and soon becomes emaciated. Different foods are tried with more or less disappointing results. The foods seem to suit the child for about twenty-four hours, but soon vomiting sets in again.

The child is constipated, passing very small amounts of fecal matter. Tongue is clean and breath sweet. Physical signs are very characteristic. There is marked emaciation rather than cachexia. The abdomen is very prominent and full above the umbilicus, while the rest of the abdomen is sunken. The pathognomonic sign is a visible stomach peristalsis after feeding. May be elicited by applying gentle friction. The peristalsis is from left to right and downward. Another swelling appears at left margin before first wave has entirely disappeared, giving an hour-glass or dumb-bell appearance.

The thickened pylorus is felt to right of umbilicus, unless it lies tucked up under the liver. It is about the size of a hazelnut and may be grasped between the fingers. It may at times be felt to contract.

Diagnosis.—The diagnosis of pyloric stenosis is comparatively simple, but to make a diagnosis of hypertrophic stenosis is very uncertain. In cases submitted to operation, or in fatal cases when a postmortem has been made, the findings are a conclusive proof. Pyloric spasm may resemble hypertrophic

stenosis so very intimately that a differential diagnosis cannot be made without cutting.

Prognosis.—The prognosis is bad unless operated early.

Treatment.—In congenital hypertrophic stenosis, operation is certainly indicated. In those cases of hypertrophic stenosis treated without operation, the condition was probably due to a spasm which yields readily to medical treatment.

CASE.—W. L., aged two months, male boy, born in Chicago; entered St. Joseph's Hospital September 1, 1908, with the following history:

Complaint.—Continual vomiting after eating, constipation, loss of weight.

History.—Father living and well, mother strong and well, only pregnancy, no abortions, good health during pregnancy. Born after difficult labor, instruments used. Breast-fed since birth. Has been well and healthy until a month ago. Present trouble began about one month ago when patient began to vomit. These attacks have continued, coming on about one-half hour to one hour after nursing. When water or other foods were given he vomited immediately. Nursed every two hours. Lately baby has been so weak that it nursed very little. For past week baby has vomited after each feeding, sometimes retaining food about one and one-half hours. Vomitus is slimy and curdled, very sour. Never noticed any blood. Stools are greenish and slimy. Bowels move irregularly; quite constipated for past few weeks. Baby urinates very little and urine is highly colored.

Examination.—Poorly nourished baby boy. Abdomen full, especially over umbilicus. Distinct wave from left costal margin downward to right. On right side distinct tumor palpable. Weight eight pounds.

Baby brought to hospital at 10:30 A. M., temperature 97.8, pulse 115. At 1:00 P. M., was given chamomile tea and at 3:00 P. M. water, which was immediately vomited. A high S. S. enema was expelled with dark green, slimy feces, very little flatus. At 6:00 P. M., he was nursed for ten minutes. Vomited at 8:00 P. M., 8:35 P. M., and 11:20 P. M., curds with brownish particles. This continued after each feeding or nursing, time of vomiting varying, coming on immediately after water, while, when milk was given, the time of vomiting was from five minutes to two and one-half hours after feeding. The child was rapidly becoming more emaciated with a temperature of 97 and pulse of 128 to 130.

On September 3, 4:00 P. M., immediate operation was decided upon and a pyloroplasty was performed. Baby returned from operating room in good condition with pulse of 132 and strong. In evening temperature was 99.8, pulse 128 to 130, very weak and slightly irregular. Hypodermoclyses of three ounces of normal salt were given at various intervals for seventy-two hours.

At 10:30 P. M., day of operation, first vomiting occurred of $\frac{1}{2}$ dram brownish slimy stuff. Vomiting at various intervals for seventy-two hours. During this time nothing by mouth was given. On September 6, three days after operation, few drops of water were given by mouth, while cacao butter was given by inunction. Vomiting still continued for several days longer, at longer intervals. On September 8, milk, thirty drops every three hours, were given without causing vomiting. After milk was given, bowels moved well, greenish-brown with considerable mucus. Feedings were gradually increased without causing vomiting. Bowels became normal and formed. Patient discharged on September 22 with instruction to mother as to care.

Baby is living and when last seen, about four weeks ago, was a large, strong, healthy boy.

History of Operation.—Patient operated by Dr. Buford under ether anesthesia. Incision about two inches in length was made in epigastrium just below sternum. Stomach was exposed and pylorus found size of hazelnut and very hard. Longitudinal incision one-half inch in length was made through anterior surface of pyloric orifice. Obstruction was complete, unable to pass finest probe. Small section removed for diagnosis. Incision was sutured transversely with fine silk. Pylorus very brittle so that stitches tore out very easily. Peritoneum, muscles, fascia and skin sutured in layers. Owing to continual retching of patient, sutures gave way. Wound became infected a few days after operation, causing rise in temperature.

Pathological Report by Dr. D. J. Davis.—Gross specimen appeared to consist of rather fine cartilage-like tissue, very brittle. Microscopic examination showed typical pyloric muscle tissue; increase in amount of muscular tissue, but not in connective tissue. No degeneration of any kind, no mitotic cells in muscle tissue, no leukocytes or round cells seen in muscle tissue; glandular tissue normal. Smears and cultures from wound several days after operation showed staphylococcus aureus.

Diagnosis.—Hypertrophic pyloric stenosis.

934 CENTER STREET.

TREATMENT OF CERVICAL TUBERCULOUS ADENITIS AT THE SEA BREEZE HOSPITAL.*

BY

LEONARD W. ELY, M. D.,

Consulting Orthopedist to Roosevelt Hospital; Surgeon to Sea Breeze Hospital, etc.,
New York.

YOUR chairman has asked me to prepare a short paper on this subject, and I find on looking over my histories, that necessity precludes a paper of any great length.

We have histories of thirteen cases treated at the hospital

* Read before the Academy of Medicine (Section on Surgery), May 6, 1910.

under diagnosis of adenitis, and besides these, enlargement of the lymph nodes has been observed in many of our patients suffering from tuberculous joint disease.

The diagnosis has been almost invariably a clinical one, for until recently we have had at the hospital no operating-room. The treatment, therefore, has been in most instances conservative, and consists largely of fresh air and attention to the nutrition of the patients. Occasionally we have practised gentle massage. Our results have been for the most part good.

It was found that, as a rule, treatment was of little avail until we removed the tonsils and adenoids. For some years we practised the ordinary operation of tonsillotomy, but about a year ago we discarded this and have since removed the tonsils entire.

The microscopic examination of these tonsils in only one case (boy suffering with Potts' disease) showed tuberculosis, but the benefits of the operation were often apparent in the subsidence of the nodular swellings in the neck.

Our experience led us to question the advisability of a radical operation in those patients presenting a moderate involvement of their lymph nodes. It seems probable that if the original source of infection is removed the nodes will subside spontaneously; but that if this be left, other lymph nodes will become involved from it.

A synopsis of the histories of a few of our cases follows:

CASE I.—M. H., five years old, female, admitted February 24, 1908, discharged October 18, 1908. Condition on admission fairly good. Child is weak on her legs, has a rickety head and chest and large epiphyses.

Heart, lungs, spleen, and liver normal.

Small nodular enlargement under left arm size of a pigeon's egg, covered with a scab. Enlarged tonsils and adenoids.

Calmette's reaction positive.

On March 22, adenoids and tonsils were removed under ether. August 17, child in excellent condition. Discharging sinus healed long since. Nodes still enlarged. Patient is to massage with sweet oil. At time of discharge patient had a few shot-like postcervical nodes and was in excellent condition.

CASE II.—K. A., three years of age, female, admitted September 10, 1908, discharged February 10, 1909. This patient is said to have had an operation about one year previously to admission for tuberculous glands. At time of admission, she presented a few small nodes in the back of her neck, possibly due to pediculosis. She had an old scar on the right side of her neck just anterior to trapezius. Nodes in left axilla

were distinctly palpable. She was very anemic. Moro tuberculosis test was positive.

Treatment was olive oil locally, and on discharge there was no sign of adenitis, and the child was in robust health.

CASE III.—M. B., aged ten years, female, admitted October 17, 1904, discharged August 18, 1908. On admission the child had two large freely discharging sinuses on either side of her neck. Under constitutional treatment the sinuses healed in three months and a half, but one or two enlarged nodes persisted and these were removed at the Presbyterian Hospital at the end of another six weeks. The child's general condition improved after this but other nodes became enlarged and persisted. Three years later, in May, 1908, another operation was done at the Roosevelt Hospital; August 18 the child was in fine condition, fat and ruddy, and presented only two or three pea-sized nodules in the posterior cervical chain. The old scars were all healed.

It will be observed that no mention is made in the history of an examination of tonsils or adenoids, and that in spite of the improved hygiene the disease persisted for a very long time.

CASE IV.—W. S., aged four years, male, admitted December 21, 1905, discharged August 11, 1906. This patient's general condition on entrance was poor. Had cervical nodes, anterior and posterior chains enlarged, and he presented a scar in front of the lower attachment of the sternomastoid with an unhealed sinus in the middle of it. Both ears were discharging freely and emitted an offensive odor. He had a scar on left buttock in the gluteal fold and another external to this; one in the right thigh just below the great trochanter, one in the right popliteal space and one over internal condyle of femur. Teeth were good; tonsils were hypertrophied. April 13, 1906, node on left side of neck inflamed and incision evacuated 2 1/2 drams of pus. May 12, another node swollen and painful; opened spontaneously. May 26, healed. June 28, node that was healed on May 26 swelled and opened spontaneously again. August 3, general condition excellent; sinus healed, nodes at angle of both inferior maxillæ palpable.

October, 1907, child examined at Roosevelt dispensary. Excellent condition. Slight general nodular enlargement of cervical epitrochlear and inguinal. Scars are all healed.

CASE V.—A. H., aged three years, female, admitted July 1, 1908, discharged October 31, 1908. Patient presented an old healed scar in the right angle of the jaw about 1 1/2 inches in length. Enlargement of the lymph nodes in that region. Several size of bean or larger. At time of discharge the child was in fine condition; no evidence of any actual glandular disease.

We consider that a great measure of our success in the treatment of these cases is due to the scrupulous care bestowed upon the teeth of the children by our dentist. Dr. Gomer visits the

hospital weekly and fills the children's teeth and cleans them when necessary.

A careful chart is kept of each child's mouth. Each child has his own tooth-brush, a state of affairs which is not as common in hospitals as it should be.

FIFTY-FIFTH STREET AND SEVENTH AVENUE.

TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

Meeting of May 3, 4, 5, 1910, at Washington, D. C.

(Continued).

INFANTILE POLIOMYELITIS: ITS RELATION TO THE COMMUNITY IN REFERENCE TO ETIOLOGY AND PREVENTION.

R. W. LOVETT, M. D., Boston, said the medical profession of to-day was confronted with the task of making a new literature upon the subject of infantile poliomyelitis. He referred to the literature up to the present time and dwelt particularly upon the aspect of the disease as it affects the community. He thought the orthopedic men who have to repair the damage done would be anxious to join hands with the pediatricists in fighting this malady. It is one of the most infectious diseases and is unquestionably on the increase. It is serious enough to warrant greater attempts on the part of health authorities to investigate the conditions under which it occurs. He called attention to the results obtained in Massachusetts in the past year. Death rate is generally from 5 to 15 per cent. Of the cases that survive over four-fifths are permanently paralyzed and many crippled for life. The recognition of outbreaks of infantile poliomyelitis was of recent date. From the time of the report of the first outbreak until 1909 had been thirty years. Sixty-nine outbreaks had been reported altogether. The outbreaks of the past five years showed that it was not a local condition. The United States showed over one-half of the reported cases. There has been an increase in outbreaks in the last five years in a way not to be explained by increased interest in the disease. There were more in cold than in warm countries. More cases reported in the United States than in other parts of the world. The writer advocated house-to-house investigation of all outbreaks by competent men. The infectious nature of the disease had been demonstrated in the laboratory by Flexner and others, but he believed the work in the field to be of equal importance. Maps prepared by the State Board of Health of Massachusetts showed the distribution of the disease there. One hundred and thirty-six cities and towns were listed, according to the prevalence of the disease. Boston was shown by districts. Density of population seemed

to have nothing to do with distribution. Most cases occurred in old houses. Prevalence of the disease was shown not to be coincident with deficiency of rainfall. Out of 187 cases, 149 children were paralyzed. There were forty-eight abortive cases. More males than females were affected. Nearly one-half of the children had been wading or swimming in contaminated water before the onset of the disease. Only 7 per cent. occurred in first year of life, but 87 per cent. in the first ten years. Pain and tenderness occurred in a large percentage of the cases. Duration of paralysis from three days to three months. No conclusions were drawn from the investigation, the report being entirely a preliminary one, but the writer thought that if the investigation of the disease by health authorities was to be continued it was to be so indicated by the representatives of the societies present.

THE CLINICAL ASPECTS OF POLIOMYELITIS; TYPES;
COMMUNICABILITY; MORTALITY.

L. EMMETT HOLT, M. D., New York, referred to the alarming increase of epidemics of the disease. He said the infection, starting in Europe, was spreading over this country and probably over the entire world. He believed there was no essential difference between the two forms of the disease, except as to communicability. The analogy to cerebrospinal meningitis was striking. Virulence was greater when the disease was epidemic, but otherwise they seemed identical. The disease varied in severity in different epidemics. Death rate in sporadic cases was much lower than in the epidemic cases. The proportion of abortive cases could not be estimated at present, but it was probable that the number is quite large. Several cases of transmission by a third party were cited. He believed that the disease is contagious and under certain conditions highly so, demanding in epidemic forms a strict quarantine. Healthy persons might be carriers of the infection. Contact with persons suffering from the disease, or associated with it, was the medium of infection. The disease seemed to vary as to its communicability at different times. The writer believed that a new name should be sought for the disease as the term used was not exact inasmuch as it is not limited to the anterior horns, nor indeed to the cord itself. He suggested the name epidemic myeloencephalitis.

EXPERIMENTAL EPIDEMIC POLIOMYELITIS AND ITS RELATION TO
POLIOMYELITIS IN HUMAN BEINGS.

SIMON FLEXNER, New York, said that in the last few months it has been demonstrated with certainty that a disease agreeing in clinical type and pathological features with anterior poliomyelitis could be produced regularly in certain of the lower animals. The knowledge of this disease had been greatly extended by this transmission, and the hope of final conquest lies along the direction of this experimental work. The transmission has been

accomplished only in connection with the higher lower animals, namely, the monkeys, anthropoid apes, and lower species of monkeys. It is merely necessary to bring the spinal cord of an affected human being who has succumbed to the disease before it has become chronic into relationship with the central nervous system of the animal. They employed the spinal cords from three children who succumbed to the disease in the first week or two of its existence and inoculated directly into the brain of the animals a suspension of the cords. The animals have been anesthetized and there is no discomfort. They quickly recover and for a variable period of time are perfectly well. Then after the passage of this period of time, which is calculated as the incubation period, they come down with symptoms comparable in all respects with the human disease. It is also possible to transmit the virus in other ways. It may be introduced beneath the skin and mucous membrane; in the peritoneal cavity; subcutaneous tissue, or circulation; but these means are less certain than direct inoculation into the nervous system. By direct inoculation the disease can be produced in 90 to 100 per cent. of cases. The spinal cord of these animals is just as infectious as the original human cord. As to just what this infection is has not yet been demonstrated. That the active agent is a virus must be assumed from the fact that the transmission can be over a long period of time. One one-hundredth cubic centimeter, without exception, introduced into the nervous system in the manner described, produces the disease. The indications are that the active agent belongs to the class of filterable viruses, the substance not being demonstrable under the ultra-microscope. They have not cultivated the virus outside of the body up to the present time. It is a highly fatal disease in monkeys. Dr. Flexner emphasized the fact that the experimental disease is not only identical with the disease in human beings, but also that the effects of it are much more intense upon these animals than upon human beings. Experiments showed that the virus was excreted through the nasal and pharyngeal mucosa; the mucous membrane of the nose and throat contained the virus. It was not absolutely established whether or not this might not be accidental. It may become infected because of its proximity to the brain. It may be the means of primary infection, and if so, this opens up a means for practical preventive measures. The intact mucous membrane of the nose is not subject to such infection, but a very small degree of traumatism opens it up to infection with the virus. It travels readily from the mucosa of the nose to the meninges. An attack of the disease appears to afford immunity in these animals. The blood serum of these animals is capable of neutralizing the virus and the blood of children who have recovered is also capable of such neutralization. He believes it will be possible to bring about such neutralization in the individual sick with the disease, though that has not been proven as yet. It is a hopeful situation. Since the disease is more virulent in these animals and it is possi-

ble to interrupt the disease in them it would seem that it can be done in human beings. There was no evidence of communicability of the disease in these animals, although it is communicable in human beings.

PARALYSIS OF THE NECK AND DIAPHRAGM IN POLIOMYELITIS.

IRVING M. SNOW, M. D., Buffalo, N. Y.—The writer reports such a case terminating in complete recovery. A boy of four years. There was pain, tenderness, and retention of urine. In a day or two flaccid palsy of the neck occurred. There was complete paralysis of the neck muscles so that patient had no control of the head whatever. Most of the distress, however, was from difficulty in breathing. For ten days remained in stationary condition. On fourteenth day of illness patient improved, but neck muscles remained paralyzed. A jury mast had to be employed for some time. Reports of several other cases found in the literature were referred to. The writer concludes that cervical poliomyelitis, affecting only the spinal accessory nerve is rare. That although paralysis of diaphragm is rare and dangerous, recovery is possible.

THE PATHOLOGY OF POLIOMYELITIS.

ISRAEL STRAUSS, M. D.—Dr. Strauss described in detail the lesions found in the disease, demonstrating them by means of many lantern slides. He said that it was no longer a disease of doubtful origin, but unquestionably due to infection. He showed how the virus reaches the meninges very early after infection. He referred to the intestinal route of infection and said, in regard to the experiments in which infection was produced by scarifying the nasal mucous membrane, that it would seem that that was really introducing the infection directly into the blood. He believes that there is a strong resemblance between the virus and that of rabies. He called attention to the interesting relations between the pathological changes shown and the clinical picture of the disease. Many of the cells in the cord were not affected and could undergo rapid recovery. The extent of the paralysis gives no idea of the extent of the lesion. He believed that in every case in which the cord is infected the bulb is also affected. He thought the hope of the future was in finding a means for checking the disease before it has attacked the ganglion cells and of finding the source of infection and preventing its spread.

TREATMENT FOR THE AMELIORATION OF PERMANENT OR PARTIAL PARALYSIS BY SILK TENDONS AND SILK LIGAMENTS.

PROF. D. FRITZ LANGE, Vienna.—The writer recommended, in the acute stage, fixation, either in orthopedic bed or plaster-of-Paris bandages. After the subsidence of the acute stage a second task developed for the orthopedist, to prevent the oc-

currence of contractions and interference with the nutrition of the affected muscles. He warned especially against rough, hard massage. The muscles could be weakened and injured instead of strengthened in this way. His method of employing silk tendons and silk ligaments was demonstrated on a model. He uses a celluloid support to prevent sinking of the arch of the foot and during the night uses a steel support. Where the muscle is too short he lengthens it by means of silk sutures.

DR. B. SACHS, New York, said, in discussion, that he rather thought the name infantile spinal paralysis was the proper one clinically. Perhaps a more proper name from a pathological standpoint would be polioencephalomyelitis. As to treatment, he considered that time given to massage and electricity in these cases was time wasted; he could not see that it did any definite good and a great deal more good would be attained by early institution of orthopedic measures. The atypical forms of the disease he considered very rare.

A COMPARISON IN BOYS AND GIRLS OF WEIGHT, HEIGHT, EPIPHYSEAL DEVELOPMENT.

THOMAS MORGAN ROTCH, M. D., Boston.—Dr. Rotch exhibited a series of charts demonstrating his comparison, showing that at first boys are heavier and taller than girls, but that the lines of weight and height cross each other at intervals. The girls' weight line crosses the boys' at about thirteen; the boys' again crosses the girls' at about seventeen. The line for height shows about the same thing. Age does not readily determine weight and height. Girls are lighter and shorter than boys at birth, but before puberty the girls gain. The charts show the lack of relationship between epiphyseal development and general growth. In grading individuals the writer believes that the epiphyseal development should replace chronological grading. That the child's welfare depends upon maintaining a proper equilibrium and there should be a curriculum adopted to certain stages of epiphyseal development.

THE CYTODIAGNOSIS OF TUBERCULAR MENINGITIS AND THE POSSIBILITY OF RECOVERY.

CHARLES HUNTER DUNN, M. D., Boston.—The child whose illness forms the basis of the paper was a girl of three years of age. Father, mother, and younger sister well; brother died of tuberculosis of spine. Nothing remarkable in previous history. December 5, two days before the writer saw her, patient began to vomit; continued vomiting all day; at 5 P. M. vomiting ceased; next morning better and played a little; in afternoon vomited once. Temperature between 99° and 100°. Increasing apathy the most noticeable feature. She was a well-developed, well-nourished child, lying on back, with eyes open, but took little interest in surroundings; eyes fixed and staring; ptosis of left

eyelid. No retraction of head. Knee-jerks somewhat more lively than normal. Moderate Kernig. Given castor oil and irrigation of colon until following day. Then began to cry out. Marked rigidity of right arm and hand. Seen again following day; had had bad night; crying out and twitching of hands. Temperature not above 100° . Apathy more marked. Occasional slight internal strabismus. Babinski's sign present. Lumbar puncture—10 c.c. cloudy fluid obtained. Examination showed no fibrin formation. Slide count showed 260 lymphocytes per cm.—2 per cent. polynuclear, 96 per cent. lymphocytes, 2 per cent. endothelial cells. With stain for tubercle bacilli several clumps of acid-fast bacilli found which resembled tubercle bacilli. Positive diagnosis made and unfavorable prognosis given. The condition cleared up and patient is now perfectly well. The writer believes the evidence of the presence of the tubercle bacilli, with the other signs, is strong evidence of its being a case of tubercular meningitis, and believes we are justified in holding out some hope in these cases. If it were possible to demonstrate the bacilli in every case of lumbar puncture it would be of great value. The predominance of lymphocytes may be generally accepted as diagnostic. He endeavored to establish a standard of the number of cells present in the fluid and found in sixty cases that the average was between 200 and 400 per cm. Should this be confirmed he thinks it will give additional means of making positive the diagnosis of tubercular meningitis. It might lead to recognition of other cases of recovery in the future.

DR. W. P. NORTHRUP, New York, in discussion, said he thought the writer had undertaken a very large proposition. He had had one of these "don't know" cases himself, but did not think one justified in feeling sure of this diagnostic method. In his case the patient had all the symptoms of tubercular meningitis and with increased fluid and increased lymphocytes on lumbar puncture, but the patient suddenly began to get better. Why, he did not know, so he referred to them as "don't know" cases.

DR. F. S. MEARA, New York, had lately correlated the cases of meningitis in Bellevue for the past three years and, of fifty in which lumbar puncture was done, in forty the bacillus was recovered. His results corresponded closely with those of Dr. Dunn. One child under one year, in whom the bacillus was found in the fluid, improved after some weeks and it was thought to be a case of recovery, but the child suddenly became worse and died. There were a number of cases of so-called meningismus in which there was slight increase in the cells.

DR. S. MCC. HAMMIL, Philadelphia, said he had not formally reported, but in discussion had referred to, a case of tubercular meningitis which he had under his care a few years ago, in which the bacilli were recovered in the fluid and in which recovery occurred. There was slight increase of leukocytes and the tubercle bacilli were found. He had not laid particular stress upon

the case because no animal injections had been made, and so the final link in the chain of evidence was lacking.

DR. J. P. CROZER GRIFFITH, Philadelphia, said that Ferbinger had reported finding the bacillus in a case which recovered.

DR. F. S. CHURCHILL, Chicago, thought that the presence of lymphocytes is not sufficient, that only the presence of the bacillus is positive proof.

DR. ISAAC A. ABT, Chicago, believed that cases of tubercular meningitis sometimes recover and cited a case seen in Vienna in which the diagnosis was made and later, the child having died of another disease, the scars at the base of the brain were shown at autopsy, confirming the clinical diagnosis.

THE GENERAL CONSIDERATIONS REGARDING THE EFFECTS OF VACCINES.

S. McC. HAMILL, M. D., Philadelphia, reviewed the work done along this line and said that the application of vaccine treatment differs in no way in children from that in adults, except in the matter of dosage. Relatively small minimum doses were generally advocated but there was considerable difference of opinion as to maximum doses. He concludes that the impressions one gathers are that it has been demonstrated that localized infections with staphylococcus pyogenes aureus are quickly cured; that generalized infections are favorably influenced. That gonococcal infections are favorably influenced. That in other diseases there is not enough data yet to warrant any striking conclusions.

THE USE OF BACTERIAL VACCINES IN CHILDRENS' DISEASES.

JOHN HOWLAND, M. D., New York, and B. R. Hoobler, M. D., New York, presented this paper, based upon cases occurring in the Bellevue Hospital during the last ten months. Infections the usual ones found in children's hospitals. They thought that unless marked specific results were obtained, conclusions were difficult to draw. There were thirty-one cases of localized infection with the staphylococcus aureus. They yielded to four or five inoculations of the autogenous vaccine. Of general systemic infections with the staphylococcus there were three cases, all of which recovered. The clinical details of one of these cases was presented. The experience with localized infection treated with the autogenous vaccine was very satisfactory. Of streptococcus infection, localized, there were thirteen cases, which yielded much less to vaccine treatment than those due to staphylococcus. Of general streptococcus infection, five cases treated. Fifty pneumococcus infections treated with stock pneumococcic vaccine used; not able to report any beneficial results nor any unfavorable ones. They were not impressed with the effects of the treatment in vulvovaginitis.

In discussion, DR. F. S. CHURCHILL, Chicago, reported a case of

meningitis due to staphylococcus infection, in which an autogenous vaccine was used, followed by speedy recovery.

DR. HENRY KOPLIK, New York, said that in the staphylococcus infections his results agreed with those of Dr. Howland; with the streptococcus infections results had been discouraging.

DR. E. W. SAUNDERS, St. Louis, referred to a case of pyelitis in which the condition was improved by the use of autogenous vaccine together with nuclein.

A CASE OF THYMIC ASTHMA (SPECIMEN).

A. D. BLACKADER, M. D., Montreal, reported a case occurring in a child ten months old, suffering from severe dyspnea. Nursed for six and one-half months, then weaned because of mother having German measles. Had severe attack of bronchitis, but with no cyanosis; respirations at that time of croupy character. No dullness then over area of thymus. Some symptoms of rachitis developed. Then the child apparently caught a fresh cold; breathing rapid and difficult, but without cyanosis. This condition increased and there was a distinct area of dullness. Operation was proposed to raise the thymus, but the surgeon declined. Child died following morning (specimen exhibited). The writer had not been able to find the report of a similar case. There was a large cystic mass between the trachea and the esophagus. It was believed that it developed from a branchial cyst.

THE FIRST SOUND OF THE HEART IN CHILDREN.

F. FORCHHEIMER, M. D., Cincinnati, said that if one were inclined to believe that after so long a time in which the normal heart sounds had been studied there is a consensus of opinions among authors in regard to their production, a review of the literature would be disappointing. The statements of various authors were so much at variance as to seem almost incredible. In connection with the normal first sound of the heart there still exists much difference of opinion, but certain modes of its production were accepted by the majority, many of whom differ as to details. In children the pitch is high, depending upon the age and size of the child, from *g* or *a* soprano below the staff, gradually becoming lower until it reaches double *b* soprano below the staff. The dominant factor in the production of the first sound is the systolic contraction of the myocardium; next to this in importance is the tense auriculo-ventricular valves; then those vibrations occurring in the large vessels; and lastly, the vibration of the semilunar valves. Instead of only two factors for each side of the heart, four in all, we are forced to accept four for each side, that is, eight as the number of component parts of the first heart sound. In the child heart the conditions are still more complicated; as the organ is slowly developing from the condition immediately after birth to that of adult life there must be transitional phases depending upon

the periods of development; the size of the myocardium as expressed by the ratio of the weight of the heart to the weight of the body is the most important factor; elasticity of the myocardium must also be considered. The writer said that whoever undertakes to make a diagnosis of a heart lesion in a child in an off-hand manner immediately stamps himself as a dilettante in heart diseases. He deprecated the manner of differentiating organic from other valvular bruits in children under three as given by Hochsinger, that under three years all bruits in the heart are organic, although this statement had been widely accepted. In children under three functional and accidental bruits are found very commonly. They depend upon myocardial conditions. Systolic bruits are found in forms of acute myocarditis due to diphtheria, typhoid, rheumatic fever, variola, gonorrhea, and septic pyemia. In chorea the bruit is produced by acute endocarditis. The writer thinks the development of the elastic tissue must be taken into consideration in explaining this bruit; if there is a disparity between the strength of the myocardium and the resistance of the elastic fibers there will result more or less of an inequality in the conus arteriosus, which acts as an obstacle; when the blood passes over this a bruit is produced. That the anemic bruit is produced directly by anemia is a matter of some doubt. In many cases of anemia there is no bruit and many bruits are attributed to anemia which are due to other causes. It is impossible to diagnose anemia by listening to the heart.

In discussion, DR. W. P. NORTHRUP, New York, emphasized the fact that many murmurs from unexplained causes in children under three do disappear.

DR. S. McC. HAMILL, Philadelphia, thought the explanation offered by Dr. Forchheimer a very valuable one. He had been convinced that there must be more than one etiological factor for these murmurs. He was glad to hear Dr. Forchheimer express the view that Hochsinger's statement was incorrect.

DR. F. S. CHURCHILL, Chicago, referred to a case of a child with nephritis that developed an acute arthritis of the knee-joint, when a systolic murmur was heard, which gradually disappeared. Blood cultures in this case were negative.

THE VALUE AND LIMITATIONS OF THE EMPLOYMENT OF COLD AIR IN THE TREATMENT OF ACUTE RESPIRATORY CONDITIONS.

DR. J. P. CROZER GRIFFITH, Philadelphia, opening the discussion of this subject, said there should be a clear idea of what really constitutes cold-air treatment. It might be used in three ways; first, exposure of the body to cold air; that is not what any of us are doing, because the children are thoroughly wrapped up and the body kept warm; second, breathing of cold air, but the cold air doesn't enter the lungs as cold air; third, the action of cold air upon the face. There could be no question about the benefit of fresh air, but we must not forget that it is not a new

thing by any means. Whooping-cough had been treated that way for many years and also phthisis in adults. He thought the employment of cold air in the treatment of acute respiratory conditions had its limitations and that not every case of such disease is to be exposed to cold air.

DR. L. E. LAFETRA, New York, described the method used at the Baby's Hospital, in which they had instituted, a "cold ward," in which the temperature was kept at about 50° F. from November to April; next to this a regular ward where the temperature is 70°; and in connection with this a steam room for administering vapor inhalations. From the cases that had been treated in the cold ward and in the adjacent warm ward he drew the following conclusions:

1. In the acute congestive stages of inflammations of the upper respiratory tract (rhinitis, laryngitis, bronchitis, especially of the small tubes, with or without bronchial pneumonia) warm moist air is of greater help than cold dry air.

2. In lobar pneumonia, with high temperature and little or no bronchitis, cold dry air is of great advantage. The same is true of pulmonary tuberculosis and of empyema.

3. After the acute stage has passed and when there is no inflammatory spasm of the larynx or bronchi, the cold-air treatment is of advantage in cases of rhinitis, laryngitis, bronchitis, and bronchial pneumonia.

DR. W. P. NORTHRUP, New York, said the essential of the fresh cold-air treatment is partly that it should be circulating, moving air.

DR. E. E. GRAHAM, Philadelphia, said that from the standpoint of private practice one is soon convinced that unless you get cold air in the sick-room you do not get fresh air, the room that is not cold is apt to contain vitiated air.

DR. JOHN HOWLAND, New York, thought it was almost the invariable experience that children with acute infections do better in cold air than in warm air and that with pneumonia they do better out of doors in winter than in summer. He thought the rise in blood pressure accomplished by putting the patient out doors could only result in benefit in these cases in which fall of blood pressure was a prominent symptom.

DR. A. D. BLACKADER, Montreal, agreed as to the value of increasing blood pressure in the latter stages, but thought that in the earlier stages lowering of blood pressure was indicated. He advocated fresh cold air because he felt that the child was getting more oxygen and a certain amount of stimulation to the respiratory center rather than because of increased blood pressure.

DR. T. S. SOUTHWORTH, New York, emphasized particularly the advantage of cold fresh air in the prevention of acute respiratory diseases and said that in their wards the temperature was now kept so low that the faces and hands of the children often looked rather blue and chapped, but that acute respiratory infections among them were now very rare.

RETAINED INTUBATION TUBE; ABDUCTOR PARALYSIS
(DIPHTHERIA); RECOVERY.

W. P. NORTHRUP, M. D., New York, presented the following unique case. Presbyterian Hospital service: ambulance admission; great urgency. Fifteen-months-old child had been suffering with diphtheritic laryngeal stenosis and wearing intubation tube two weeks: had had whooping-cough four months before contracting diphtheria. Came into the hospital with urgent dyspnea and immediate intubation was attempted by ambulance surgeon. Intubation unsuccessful but efforts resulted in relief. When the writer tried intubation the tube met with obstinate resistance. Smallest tube was gently forced past obstruction and relief followed. Artificial respiration was immediately necessary. The first diagnosis was catarrhal laryngitis in a larynx recently injured by diphtheria and intubation, and marked nervous element being added from the recent whooping-cough. There was pseudomembrane visible, tonsils very large, coarse râles everywhere over both lungs. Two days after admission respiration was free but signs of consolidation appeared at one apex. After three days tube was taken out; after brief sleep child choked up and ceased to breathe; with great difficulty tube was reinserted and artificial respiration again used. Quick emergency relief was required a half-dozen times in the first few days. He coughed out all the tubes put in. Required intubation forty times during stay in hospital; increasing sizes used. Patient was discharged, but again returned with dyspneic symptoms and is still in the hospital. The secondary dyspnea would seem to have been due to diphtheritic laryngeal paralysis plus subglottic swelling, complicated with marked nervous spasm.

THE BACTERIOLOGY OF THE BLOOD IN EARLY LIFE.

F. S. CHURCHILL, M. D., Chicago, said that the medical literature was replete with reports of the study of the bacteriology of the blood in adults, but few reports had been made of such study in infants and children. In scarlet fever alone had such work been done. Together with Dr. Clarke, the writer had studied a series of cases, which were reported in detail. The study consisted of fifty examinations on forty-four infants and children and the study of sixteen cases postmortem. He believes that as blood cultures in adults had yielded information of such scientific interest and value, that there is need of more of this kind of work in the study of diseases of infants and children as it is reasonable to suppose that blood cultures in early life may be of even more value than in later life. Charts were exhibited showing the details of the cases studied and will be published in the paper.

In discussion, DR. L. EMMETT HOLT, New York, said the taking of cultures in the infections of infants had not appealed

to him much as a practical procedure because the difficulties were great and the results not commensurate with the risks.

DR. HENRY KOPLIK, New York, said that with very young infants he had had the same difficulty as Dr. Holt; it was difficult to get enough blood to make a satisfactory culture and in these cases the results had not been as satisfactory as with the older children. He thought, however, that there were some cases in which the results were very excellent.

DR. ISAAC A. ABT, Chicago, thought that in the hospitals cultures should be made and he had found that they throw a very important light upon many conditions. The efficacy of the work depended much upon the expertness of the man making the blood culture.

DR. DAVID BOVAIRD, New York, advocated the taking of blood cultures in children and thought that as the technic was perfected the same sort of accuracy as was now obtained in adults would be gotten in the study of the diseases of children.

DR. DAVID L. EDSALL, Philadelphia, had come to rely upon blood cultures as the most valuable means of diagnosis in obscure conditions of older children. He thought it a method of great value.

DR. F. S. CHURCHILL, Chicago, said in conclusion, that while we did not know a great deal about the subject of the bacteriology of the blood in infants at present and could not draw any very definite conclusions, it was important to go ahead with this study, for any accurate method that may add to the knowledge of these conditions should be given a thorough trial.

ACUTE PERICARDITIS IN CHILDREN.

DAVID BOVAIRD, JR., M. D., New York, presented this paper, which consisted largely in charts showing in detail the studies carried out on a series of cases, the first one comprising a series of fourteen cases of acute pericarditis in children under the age of five, at the New York Foundling Hospital, during eight years. Acute pericarditis occurred at practically all ages. There was an astonishing prevalence of boys in the list. It was in most cases a secondary affection; secondary particularly to affections of the lung, pleurisy or pneumonia. It complicates bronchopneumonia or lumbar pneumonia without distinction. Of the fourteen cases eleven were purulent. The second chart comprised a series of seventeen cases of pericarditis, acute. Twelve out of the seventeen were cases of rheumatic fever and in almost all the type of inflammation was fibrinous or sero-fibrinous. The writer called attention to the importance of the recognition of pericardial dullness in the fifth right interspace and especially to the progressive increase of this dullness; if the right and left limits of cardiac dullness are outlined within twelve or twenty-four hours it is possible to demonstrate any increase of this dullness. Its differentiation from acute dilatation of the heart is of importance. He referred to the great value of the *x*-ray

as now employed in the diagnosis of these conditions and said it was now possible to make out pericardial effusions with great accuracy by this means so that the aspirating needle could be used with greater safety. He advocated aspirating at the fifth interspace.

In discussion, DR. HENRY KOPLIK, New York, pointed out the great difficulty of making a diagnosis of pericarditis in young infants because of the fact that the heart lies in such a way that the effusion first begins in the posterior superior angle and unless the fluid approaches 200 c.c. diagnosis cannot be made. He warned against aspiration as the exudate is apt to become encapsulated and partitioned off and there was danger of getting into the main sac and piercing the ventricle.

DR. ISAAC A. ABT, Chicago, said the great danger of puncture in all these cases is that it is very difficult to differentiate between a serous and a purulent effusion, and the so-called acute adhesive pericarditis.

CHYLOUS ASCITES IN INFANTS.

D. M. COWIE, M. D., Ann Arbor, reported a case seen a little over a year ago with the following history: delayed birth; difficulty in labor due to the large abdomen; the abdomen greatly increased in size after birth. X-ray showed no tumor; scrotal sac was tense, but gentle taxis could push fluid up into abdominal cavity. Photograph of the interesting condition was shown. Child recovered, though it still has attacks of occasional blueness. It had been at first thought that there was a heart lesion of some kind. Orthodiagraph showed the right part of the heart further to the right than normal in a child of that age and size. The right heart was very much enlarged. It was believed that the case was probably due to some form of congenital heart disease.

Analyses of the fluid were given in this paper; all the elements of chyle being found in the fluid.

Adjournment.

Officers for Ensuing Year.—*President*, HENRY D. CHAPIN, M. D., New York; *Vice-President*, J. MASON KNOX, M. D., Baltimore; *Secretary*, SAMUEL S. ADAMS, M. D., Washington; *Treasurer*, CHARLES HUNTER DUNN, Boston; *Recorder and Editor*, L. E. LA FETRA, M. D., New York; *Member of Council*, ISAAC A. ABT, Chicago.

Place of meeting, Lake Mohonk. Time, May 31, June 1 and 2, 1911.

TRANSACTIONS OF THE CHICAGO PEDIATRIC SOCIETY.

Meeting of February 17, 1910.

The President, I. A. ABT, M. D., in the Chair.

DR. GEORGE W. COOK read a paper entitled

"SOME INVESTIGATIONS ON THE TEETH OF SCHOOL CHILDREN."

The author called attention to the bacteria found in decayed teeth of children. He stated that they act largely in the decomposition of food, breaking up the carbohydrates and causing disturbances lower down in the digestive tract. Miller by subcutaneous injection of the bacteria of decayed teeth produced septicemia in animals. At six years of age the first permanent molars appear. These are very often neglected and soon decay, oftentimes with pus formation about the roots. This may cause digestive disturbances and also bring about an irregular development of the jaws with attendant deformities. Tubercle bacilli may pass through the roots of such teeth and thus into the lymph circulation. Virulent pneumococci, pus-producing organisms, and other bacteria that may decompose proteids and carbohydrates are found in decayed teeth. He urges more close observation of the hygiene of the mouth during infancy.

DISCUSSION.

DR. JULIA D. MERRILL.—Frequently children come to the dispensary with the temporary and even first permanent molars badly decayed. They are mere yellow or black shells filled with detritus; the neighboring glands are considerably enlarged, showing infection has occurred, and there is a history of frequent attacks of toothache. Repeatedly dentists have returned these cases, refusing to extract the teeth, saying they must be saved for the sake of the permanent ones. Is it wise to retain such useless and dangerous teeth?

DR. COOK.—It is better to retain such teeth as long as possible, although, when nothing else can be done, they should be removed. Treat them when you can and make the mouth aseptic until the permanent teeth make their appearance. It is a very common thing among dentists to save these temporary teeth, even after the pulps have been destroyed, so long as the roots are not absorbed. But they must be removed eventually, in order to let the permanent teeth come in.

DR. E. J. DENNIS.—I have had some experience with teeth. The temporary teeth are usually of a very highly organized

nature. The amount of lime salts contained in them is usually small and the tubules are of large size, although the amount of cementum material between the tubules is comparatively small. That permits of more rapid decay than is the case with the permanent teeth. Decay, when it sets in, is usually caused by a lack of cleanliness, although the incomplete formation of the enamel over the teeth, or fissuring of the surface, favors infection and decay.

Another thing in connection with children's teeth is the size of the pulp, which is out of all proportion to the size of the teeth. This also hastens the process of decay and usually results in the removal of the teeth. They decay so rapidly that in most cases, except in the better class of people, who care for their children, the temporary teeth are gone before much can be done for them. The canals and the apical openings in these teeth are very large, allowing of granulation tissue penetrating the interior of the tooth tissue, which resembles pulp structure, and is very sensitive. Under such circumstances the child does not chew its food properly. When the teeth are decayed down to the gum margin, there is a shortening of the bite. The anterior teeth decay much less rapidly and the lower teeth are forced into the upper gums. This is not especially serious, but it does have an effect on the eruption of the second teeth. When that is the case, the first permanent molar is considerably shortened. That tooth preserves the length of the bite of the second teeth because it erupts at a time when the temporary teeth are being lost gradually. It preserves the distance between the jaws so that the other teeth will attain their full length.

An interesting feature, which is apt to be mistaken by physicians for a sign of specific disease, is the peculiar malformation of the enamel, especially in the permanent teeth. There are rows or ridges of firm enamel across the anterior teeth, indicating that the enamel has not been deposited properly on the dentine. The end of the tooth is irregular in shape and oftentimes the cutting-edge of the incisors is hollowed out to such a degree that it answers very well to the description of the Hutchinson tooth. Most of these cases are not due to specific disturbance, but to some infectious disease at the time of the first deposit of enamel on the dentine. Frequently there is a history of scarlet fever or measles at the time when the cusps of these teeth were forming.

Then there is the question of retention of the first permanent molar. Usually this tooth is not recognized as a permanent tooth. It erupts at the age of six years, and failure to recognize it as a permanent tooth often permits of its rapid decay. The tooth breaks down to the gum margin and before the root is completely formed the crown of the tooth is gone, the pulp dead, and granulation tissue is springing up through the apical foramina, which are not permanently closed. Sometimes this opening in each root measures one-eighth of an inch in diameter. The question is, What shall be done with such a tooth? Shall

it be extracted or retained? It is impossible to regulate the length of the other teeth. Usually, when a tooth gets in such shape as that it is so thoroughly infected, and the apex is so large, that the disinfection of the root of the tooth is almost impossible. Such a tooth should be removed very early; the results following such removal are not as serious as those that follow the retention of the tooth. In the case of the majority of children, at least in the poorer class, the only thing that can be done for such a tooth is to remove it.

DR. COOK (closing the discussion).—In regard to the temporary teeth being out, of course the first permanent molar is an important tooth in the arch and it is also an important tooth in its anatomical relation to certain lymph structures. Infection is often carried from this tooth into the lymph structures, and often causes considerable and serious disturbances. Some years ago I made investigations which showed that out of 245 children, eleven had tubercular infection in the glands, evidently because of trouble with the first permanent molar. That is a point which has not been mentioned, nor is it thought of by most people.

Meeting of March 15, 1910.

The President, I. A. ABT., M. D., in the Chair.

DR. G. L. KAUFMANN read a paper on

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS, WITH REPORT OF CASE.*

DISCUSSION.

DR. C. G. GRULEE.—There is a difference of opinion between German and American writers on this subject. The Germans regard the condition as a spastic one, and the hypertrophy the result of the spasm. Most American writers regard the two conditions as being entirely separate and distinct. Several cases have been reported recently that are rather interesting from this standpoint.

Bernheim-Karrer had thirteen or fourteen cases, of which number he was able to follow seven for two or three years after the treatment. He found that in each case there was at the end of that time dilatation of the stomach and increased acidity. Russel recently reported a case of a child, about five years old, which died of cyclic vomiting. The history was that the child had attacks every few months from the time of birth, lasting twenty-four hours. At the postmortem a pyloric stenosis, with marked dilatation of the stomach, was found.

With regard to the treatment, there are two schools. Heubner

* See original article, page 158.

holds that these patients should be fed large amounts at long intervals. The other school holds that they should be fed in small amounts at frequent intervals. Nutrient enemas have always been used, and Koplik used sodium citrate *per orem*, but with only temporary success. Whether all these patients should be operated on is answered in the affirmative by Americans, and probably with justification. During the last two years of nineteen cases subjected to nonoperative treatment, fourteen recovered, five died. Of twenty patients operated on, fourteen recovered and six died, so that there is not much in favor of operative treatment, but probably the operated cases were more severe than the nonoperated cases. In Koplik's statistics there were four cases of true congenital pyloric stenosis. Two were operated on and two were not. One patient of each class died, which would seem to show that there is not a great deal of difference.

DR. H. W. CHENEY.—The doctor should be congratulated on the successful result of his case. The late results in these cases are of interest. About three years ago I showed a patient here on whom a successful operation had been done. That child has thrived ever since, and is now a strong, healthy boy, four years old, with absolutely no trouble with either stomach or bowels. In that case a gastroduodenostomy was done. The child had a bad time of it the summer after the operation, suffering more or less from intestinal indigestion and enteritis. The food, instead of being digested properly, seemed to pass through the abnormal opening at once, and after each feeding there was a bowel movement, but under proper feeding this was checked and the child improved speedily.

This case was the second successful operation for the above condition done in this city.

DR. I. A. ABT.—It would be interesting to know if it is possible to differentiate the cases of spasm from those of true congenital hypertrophic stenosis. This is a point which confronts one clinically.

DR. H. F. HELMHOLTZ.—In a recent publication by Wernstedt, he goes carefully into the postmortem findings of all the cases in which he could obtain accurate pathologic descriptions, and in this series he could not find a single one that would conform to the picture of a congenital stenosis. In every case that had been autopsied there was a folding of the mucous membrane, showing that at one time there had been a patulous opening of normal size, and which as the result of the spasm had been narrowed down, producing an infolding of the mucosa.

As to the treatment, the continuous rectal irrigation by the drop method, introduced by Finkelstein, seems to have a definite relaxing action on the pylorus.

Another point that Meyer brought out in cases of spasm, which recovered, was that the infants were fed for a long time with only minimal amounts of food. If the spasm disappears quite

suddenly, and the infants are allowed to take large amounts of food, an acute intoxication can be readily induced, and death result. I saw one such case.

DR. I. A. ABT.—Is it possible that some of these cases have a relation to the spasmophilic diathesis? Do such children later on show evidence of tetany or spasmophilia?

DR. F. X. WALLS.—I saw a child last Sunday, four days old, which began vomiting an hour after birth. The vomiting continued for two days; then the baby was put on small amounts of water. There was some elevation of temperature. When I saw the child it weighed about nine pounds, but was fairly well nourished. It vomited during the examination. One could see the stomach wave passing from the left to the right. The child seemed to be suffering when we examined the stomach with the catheter; there seemed to be more fluid than one would expect in such a young child. The child was taken to the hospital in a stuporous state and twitching, which terminated in general convulsions. Dr. Cotton saw the patient yesterday and without consultation made a diagnosis of hypertrophic stenosis of the pylorus. We tried rectal instillation, but the child could not tolerate the catheter. There was so much tenesmus that anything passed into the rectum was immediately expelled. There was more or less blood in the evacuation. The temperature did not remain high. The child is still vomiting continuously, and peristalsis can be seen from time to time. The question is just what to do. One hesitates to operate on a child so young, and with so little vitality. The diagnosis is distinctly difficult, because, except for the evident peristalsis, one might think it a case of cerebral hemorrhage or other condition usually associated with projectile vomiting and unconsciousness. I have seen about fifteen of these cases, and in twelve an operation was performed. I was favorably impressed with the results obtained. A child with any degree of vitality seemed to react well to the operation, and those that did react in that way recovered. Only two children died soon after the operation, and one about a month afterward, from some acute gastrointestinal disturbance. The other children are living, many of them in very good condition, years after the operation. I would be inclined to suggest surgical intervention as soon as I believed I was losing ground, after having tried the various methods of medical treatment that have been suggested.

DR. EFFA V. DAVIS.—I would like to suggest toxemia of pregnancy as a possible cause in the case of so young an infant as has just been reported. Very often infants born of toxic mothers suffer; they manifest conditions after birth that are due to their sharing in the maternal disturbance while *in utero*, convulsions being common, though many other milder symptoms can be traced to the mother's poor condition.

I would like to know whether in the case just reported there was any evidence of toxemia in the mother?

DR. F. X. WALLS.—This was the second child. The first is living and well, at twenty months of age. It is stated, however, that during the pregnancy the mother was not well; that she suffered from some gastric disturbance. She took considerable amounts of acid. The labor was uneventful and the mother now presents no symptoms of any disturbance.

DR. KAUFMANN (closing).—The differential diagnosis between pyloric spasm and true hypertrophy is difficult. Cases presenting symptoms of spasm should first be treated medically, but when the child is losing weight rapidly, surgical intervention is indicated. True hypertrophic stenosis will never get well with medical treatment. It would be interesting to keep a record of these cases of pyloric spasm in order to trace back to them any gastric disturbance, such as carcinoma or ulcer of the pylorus, which might occur later in life. There may be some connection between the diseases of childhood and those of adult life.

DR. HENRY F. HELMHOLTZ read a paper on

THE PYROGENIC ACTION OF SALT SOLUTIONS IN RABBITS.

The interest in nonbacterial fevers has been greatly increased by the discovery of the pyrogenic action of salts and sugar when given to infants, subcutaneously and by mouth. Older experiments by Krehl tended to show that in rabbits also 5 per cent. salt solutions when injected subcutaneously produced fever.

The experiments can most conveniently be grouped under the modes of administration of the solution.

1. Subcutaneous injection. Eight injections with 5 per cent. sodium chloride gave an average reaction of 0.18°C .; a maximum reaction in of 0.4° . Sodium bromide given in the same concentration and the same amount, 0.5 grm., gave an average reaction of 0.33° and a maximum of 0.65° . Sodium bromide gave a maximum reaction of 1.1° and a general average of 0.32 . Krehl's average reactions for the same salt were 1.3° , 1.2° , and 0.9° , differing very markedly from the above results, but representing only two or three experiments in each instance.

2. Intravenous injection. Distilled water in small amounts had a marked pyrogenic effect, an average reaction of 0.85°C .; 5 per cent. sodium chloride in three to four times the amount, gave only one-half the effect, average 0.45° ; Locke's solution even in large quantities had practically no effect on the temperature.

3. Intraperitoneal injection. Ten experiments average 0.5° reaction.

4. Administration *per os*. Of seventeen experiments, nine reacted with elevations varying from 0.2° to 0.9°C . One animal in particular reacted on three occasions with temperature of 0.6° , 0.65° , and 0.9° above the highest control temperature taken the day before and after, corresponding in a measure to the reactions obtained by Meyer in infants. The preliminary

irritation of the bowel by butyric acid produced no effect practically on the temperature reaction.

DISCUSSION.

DR. I. A. ABT.—Not long ago, in a case of gastrointestinal intoxication with collapse, we gave a large dose of salt solution subcutaneously night and morning; the temperature rose from subnormal to considerably above normal. What significance is to be attached to this rise of temperature? Is it to be considered a toxic state produced by the sodium chloride or a protective action of the body? For example, during pneumonia there is great retention of sodium chloride from the time of the chill until the crisis. Possibly this retention of salt is a manifestation of a protective action on the part of the organism against infection, and not an expression of a toxemia.

DR. HELMHOLTZ (closing).—In the reactions of the organism to salt solution there is not only a rise of temperature, but also a leukocytosis, in some instances reaching twenty or thirty thousand. As to whether the action of sodium chloride is to be considered toxic, one can only argue by analogy, and from the fact that in some cases it does seem to act detrimentally. While there may be for a time an increase of sodium chloride in the body, and a heaping-up of water, which may reach amounts as high as seven hundred or a thousand grams, it is difficult to say whether this action should be regarded as detrimental rather than beneficial. This is a proposition still open to discussion.

COMPULSORY ISOLATION ON THE PREMISES PROPER TREATMENT FOR WHOOPING-COUGH.

DR. J. H. HESS.—Recently I was advised by the Health Department that an inspector had stated I was advising taking children ill with whooping-cough into the streets without proper precautions. About four years ago one of my patients was reprimanded for taking the child into the park. I heard of it through the family, who said the inspector had told them they must not take the child out of the flat building except by the rear entrance, although the child might be allowed to play in the backyard of a six-flat building. The case which called forth the letter I received was treated in accordance with these instructions. Two years ago two of my children had whooping-cough. A red sign was on the front door for about ten weeks. I tried to imagine the difficulty my wife would have in keeping the children in the house.

I have watched the Health Department bulletin for the last two weeks with regard to whooping-cough and have found that there are just about as many cases in the seventh ward, in which I live, as are reported from the entire city. I also inquired of about fifteen doctors as to what they were doing about these cases, and found that most of them are not reporting them at all.

Nothing has afforded me so much relief as the compulsory

placarding of all contagious cases. It has relieved me of a great deal of responsibility. Many people formerly objected to placarding, and were quite ready to change from their regular medical advisor to one who does not report his cases, to prevent placarding. This is another point we must consider. Yesterday a little boy stopped me on the street and said that the school physician asked him to bring a certificate so that he could go back to school. He had had measles, and although I was the family physician I knew nothing about his case. Another family is giving to its child, ill with whooping-cough, the prescriptions which I wrote for a friend so that they would not have to have the case reported and the house placarded. These are the important contagion spreaders.

The isolation and confinement of cases of whooping-cough during the febrile period is the best treatment, but I cannot make myself believe that isolation of a case within a flat is good treatment. It is not only a hardship, especially in summer, but a difficult thing to do at any time. I would suggest that these children be placarded with a red ribbon marked whooping-cough, as was first suggested by Grandy, of Norfolk, Virginia, so that they can have the privilege of enjoying the open air, if necessary, in the uninhabited parts of the parks. I am firmly of the belief that the paroxysms of whooping-cough, which are always more frequent at night, are in part occasioned by vitiated air. In my experience these children are in better health if they are allowed to be in the fresh air after the febrile period. The question that arises is, Can one give sufficient fresh air to these children within the four walls of a flat?

Instead of depending on physicians to report these cases, why not make every mother an inspector and every case of whooping-cough will surely be reported. This plan of wearing a red ribbon works well in Virginia. Why not in Chicago?

DR. HEMAN SPALDING.—We are glad to get any suggestions to help us control the spread of whooping-cough, a disease which in Chicago does not kill so many as does scarlet fever or diphtheria, but kills enough to make it imperative that we do something to protect susceptibles from the disease. In London whooping-cough kills twice as many as diphtheria and three times as many as scarlet fever. Last year 1,246 children died from whooping-cough in London, and only 151 in this city. We have an ordinance which requires the placarding of the house and of the establishment of quarantine. We allow adults to go about their business if they are careful not to have their clothing soiled by the patient. We allow any children who have had whooping-cough their liberty, but any who have not had it are liable to come down with it at any time and must be kept at home.

Doctors confuse treatment of a case with the treatment of the public. We know that it is best for the child to go out and have fresh air, but we are not treating the child. You are doing that and in doing so you are liable to lose sight of the rights of the

public. The child could go out on the back porch, but the question of the backyard is an open one. The child will go to the fence and convey the contagion to a neighbor, or out into the alley and infect other children, and an epidemic results. You do not want your children to come in contact with these cases in a park or on the street. I have known scores of instances of contagion conveyed in that way. We have many people coming to the Department reporting such cases.

As to tagging the child, it would not do at all, because scores of children would run after such a child out of curiosity. In some parts of the city we can do better work without placarding, because the card attracts too much attention, and people congregate. We cannot improve much on our present quarantine. The trouble is that people will hide cases, but they are law-breakers. Some of them get caught at it, and are taken into court. The law requires the parents to report the case, if the doctor does not, or if they have no doctor. We can take these people into court and fine them. Our present quarantine methods seem to me as good as any method short of hospitalization.

DR. H. W. CHENEY.—Dr. Hess' suggestion might be carried out to a certain extent. In some neighborhoods quarantine might be made discretionary. The patient should be allowed to go outside of the house, if accompanied by the parent or nurse, so that they will keep the child away from others.

DR. S. J. WALKER.—The object of the Health Department in carrying out quarantine is to limit morbidity and to reduce mortality. In the case of acute infections of limited duration, it is easier to carry that out than in the case of whooping-cough, which is extremely widespread—much more so than even the Health Department, with its vigilance, is aware of. Therefore, the morbidity is very excessive. Practically every case of whooping-cough for the first two weeks is in an incipient stage, and during that time the disease remains unrecognized and is spread broadcast. In a number of cases the incipient stage extends over a period of three or four weeks, or even longer; therefore it is impossible to control that element in the spread of infection. We all know that the best thing for a patient with whooping-cough is plenty of fresh air. It is impossible to get sufficient fresh air in a flat or house, or a small backyard. I am convinced that the mortality from whooping-cough would be very much increased if a stricter quarantine is enforced, although the number of cases might be curtailed. I do not see how it could be otherwise with a disease extending over so long a time. There is much difference of opinion as to how infectious or contagious whooping-cough is. I do not see how it is possible to properly isolate children in the very poor districts, where there is so much overcrowding.

DR. HEMAN SPALDING.—Proper quarantine cannot be maintained in any case that is not confined within a hospital. If you have one part of a park set aside entirely for whooping-cough

cases, and a doctor to superintend, getting his patients to that place, some good could be done, but you cannot trust nurses or parents or anybody with the child on the streets. Another thing is that the neighbors will say that they are not afraid of the disease, and will make no effort to keep their children away from the patient. If we had hospitals for the confinement and isolation of all contagious diseases, the morbidity could be limited without increasing the mortality.

DR. GOTTFRIED KOEHLER.—The question is rather a narrow one. This matter might be considered from two view-points: First, from that of the patient; second, from that of the public and the health officer. The public demands protection from disease, and the patient demands treatment from the doctor. The health officer is concerned with the public; the doctor only with the patient. Health officers are beginning to realize the increased mortality from whooping-cough and measles. In the United Kingdom it has been increasing, while the mortality from scarlet fever and diphtheria has been diminishing, perhaps because these diseases are under proper control. In the United States the mortality from whooping-cough is as high as from scarlet fever, this showing the importance of doing something to prevent the occurrence of whooping-cough. In measles we have a prodromal stage, which is not distinctly recognizable, while in whooping-cough the catarrhal stage also goes unnoticed. When a physician is first called in consultation, the diagnosis cannot be made, and it is during this stage of the disease that contagion is spread; in fact, it is then that the greatest period of infectiousness occurs. This nullifies all efforts that might be made to control the spread of the disease. The greatest harm is done before it is recognized. Isolation on the premises is, in one sense, the proper thing, from the health officer's standpoint. There cannot be any class legislation and there are certain localities in the city where it would be impracticable to permit these patients to go on the streets or in the playgrounds in small parks. On the other hand, the question arises whether these cases would be reported if an effort were made to enforce the regulations. During 1907 there were 450 cases reported, and 250 deaths. During 1908 a larger number of cases were reported, with a lower mortality. These reports show that with the increase in the number of cases reported there was a material reduction in the death rate. The death rate in 1909 was lower than that of 1908. With this compulsory placarding and notification, the death rate has diminished. If the patient is in safe hands, there is no reason why the child, labelled as Dr. Hess suggests, could not be taken on to the streets and into the parks. On the other hand, every child which is allowed to run around without supervision should be taken off the street immediately. His method would require a considerable force of officers, but it is worth considering. I agree with Dr. Spalding that the red ribbon would not be a good thing in certain districts.

It would attract attention. Children would congregate around the little patients, and it might make trouble for them, to say nothing of the spread of the disease.

DR. EFFA V. DAVIS.—I saw a case of whooping-cough on a street-car the other day. The child was with a well-dressed father. If that child had worn a badge or ribbon, the conductor would probably not have allowed it on the car. I would like to see some such method tried.

DR. F. X. WALLS.—Whooping-cough is very different from the other infectious diseases of childhood. The average child with whooping-cough is not sick enough to go to bed. It is only the unusually severe case, or the debilitated child, that goes to bed. It has been my experience to have these cases come to the clinic because of some other trouble, and when I found that the child had a suspicious cough I suspected that it might be whooping-cough, and I ordered isolation. I always do this until I am certain of my diagnosis.

In a large portion of these cases the physician is not consulted at all. The mothers take care of the children. I doubt that the placarding of these cases during the past two years has really altered the conditions, so far as mortality is concerned. More cases are reported, but the percentage of death is the same.

The enforcement of isolation would certainly be productive of much good, but under the existing conditions our efforts along the lines of a vigorous quarantine will meet with so much opposition that the results will not be as good as they might otherwise be. The results would be discredited or materially nullified.

DR. H. F. HELMHOLTZ.—The etiology of whooping-cough is still doubtful, although the Bordet bacillus is generally accepted as the exciting cause. It is present in enormous numbers in the catarrhal stage, but in the spasmodic stage it is not often found, but is generally replaced by the influenza bacillus.

DR. I. D. RAWLINGS.—I believe that placarding the premises is the proper thing. We get complaints from many sources that we would not get if there were no placarding or quarantine. Last summer we had under consideration placing a nurse in the various parks and playgrounds to detect these whooping-cough cases, because these are the greatest factor in spreading whooping-cough during the summer months. I believe that through the placard we hear of cases that we would not know about otherwise. We are doing at least that much to prevent the spread of the disease. The department must enforce the ordinances.

DR. HESS (closing the discussion).—I make about 50 per cent. of my diagnoses of whooping-cough from the mother's story. I seldom hear the whoop. I have made numerous blood counts and have done much to make an early diagnosis. Staining slides was of interest, but it is difficult to differentiate the Bordet from the influenza bacillus. So that if you do not hear the whoop, how are you going to hold the physician responsible

for reporting a case. It makes us unwilling to invite quarantine. We do not want to report a case on the mother's diagnosis, and we are unable to make the diagnosis otherwise, in many cases, whereas, with a limited quarantine, compulsory placarding and tagging, such cases as are missed by the physician or neglected by parents will certainly be reported by some neighbor.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Familial Discoid Cataract.—N. B. Harman (*Proc. Roy. Soc. Med.*, Feb., 1910) records two cases of familial discoid or Coppock cataract, so called on account of its occurrence in a family of that name which showed a remarkable hereditary transmission of the defect in the lens, large numbers of the family in several generations having been proved to bear this curious family mark. The cataract is one of singular delicacy. It consists of a small plaque of density, of perfectly circular outline, of uniform density, which are perfectly symmetrical in the two eyes. It measures from 2.5 mm. to 4 mm. in diameter. By taking the parallax it is determined that the opacity is in the posterior region of the lens, between the nucleus and the posterior pole. No microscopical sections have yet been made of any case, but it seems pretty evident that the opacity is caused by some deposit between the lens fibers. In some of the cases described by Nettleship the density has been sufficient to cause diminution of visual acuity, and the same occurred in cases described by Chance; but in the two children here reported there is little or no measurable diminution of visual acuity consequent on the presence of the opacity. There is one peculiar feature in these cases of familial discoid cataract: the parents are free from any signs of lens defect. It follows, therefore, that the defect was either latent in the germ-plasm of one or other of the parents, or also that the combination of the germ-plasm of the parents was defective in its resultant. None of the parents' relatives have yet been examined. These cases are of interest: either they are initial cases of the defect, or, should defects of similar character be found in collateral ancestors, we should have a discontinuous inheritance, a feature that is directly contrary to the rule of hereditary cataract.

Dwarf Tapeworm in Children.—O. M. Schloss (*Arch. Ped.*, Feb., 1910) has examined the stools of 230 children between two and twelve years of age from tenement houses in New York City. In sixty-seven of these intestinal worms were found and in fourteen of these, or 6.08 per cent. of all examined, the dwarf tapeworm (*Hymenolepis nana* or *Tænia nana*) was discovered. Eight of these fourteen cases showed symptoms due to the presence of the parasite. The symptoms may be divided into two groups: (a) gastrointestinal and (b) nervous. Eosinophilia,

the percentage varying between 6.5 and 22 per cent., was present in seven of the eight patients who suffered from symptoms. In the patients who showed no symptoms eosinophilia was uniformly absent. The number of worms harbored by the different patients ranged from 50 to 700. It is possible that human infection with *Hymenolepis nana* occurs from contamination of food with the feces of infected rats or mice. The available evidence indicates that infection may follow the ingestion of ova from the feces of infected persons. The diagnosis is easily established by finding the ova of the parasite in the feces. Treatment with male fern is effective, but may require repetition. In cases where the treatment is not entirely effective the ova appears in the feces after an interval of about fifteen days.

Thermosemeiology of Scarlatina.—Jean Barannikow (*Arch. de méd. des. enf.*, Feb., 1910) desires to show some special characteristics of the rise of temperature in scarlet fever, which will aid in giving a prognosis as to the duration and final result of the disease. His work is based on the records of the Children's Clinic at the Hospital of Kharkoff. There were 209 cases submitted to the author's researches. The curve derived from these cases serves as an indication of the gravity of the evolution during the epidemic chosen for examination. The author has worked out the average curve for a period of thirty days. He shows that scarlet fever has not ceased to be present in Kharkoff for the past six years, especially in September and October. Most of the patients were between two and seven years of age; the mortality was greatest at about the age of two years. The clinical picture of an infectious disease depends on the simultaneous action of the causal agent and the reaction of the organism against it. Predisposition, hereditary and acquired peculiarities, and the kind of bacterial flora play an important rôle. The typical curve of scarlet fever attains its greatest rise in the first three days of the disease, after which it shows a tendency to lysis. It is possible to predict within twelve hours the time when the fever will go down from observations on the fourth or fifth day. When the curve has been affected by outside influences it is possible to predict before examining the patient the arrival of other complications. Sudden falls of temperature between the third and thirteenth days are constant in every epidemic of this fever. The fall is dependent on certain laws; the rise of temperature in the first days of scarlatina makes it possible to predict precisely when the general character of the curves of the local epidemic are known. Diphtheritic angina appearing with scarlatina causes a rise of temperature, which descends when serum is given in sufficient amount. The principal source of this infection is from chronic cases of diphtheria of the naso-pharynx. These patients have immunizing bodies in their blood similar to those of horse serum. They appear to be healthy but disseminate disease constantly. Ulceration of the eyes, nose, and angles of the lips is seen, commencing

at the time of desquamation, and being especially tenacious in scrofulous children and those having decayed teeth. Measles has only a slight effect on scarlatina as a complication. Whooping-cough has rather a favorable effect on scarlatina.

Diphtheria-bacillus Carriers in Public Schools.—F. H. Slack, B. L. Arms, E. M. Wade and W. S. Blanchard (*Jour. Amer. Med. Assn.*, 1910, liv., 951) record an investigation of the throats of about 4,500 pupils in Brighton District of the public schools of Boston. Within four consecutive days cultures from practically all of these children were made and examined. This was done again a week later, and repeated examinations were made of the cases showing diphtheria bacilli, a little over 1 per cent. of the total. The positive cases were excluded from school as far as possible. The examiners conclude from their findings that at least 1 per cent. of all healthy school children are carriers of morphologically typical diphtheria bacilli. Such bacilli are communicable from one person to another and the condition is usually a transient one. The organisms are ordinarily of little or no virulence. While it is possible that by passing through a susceptible individual their virulence might be raised to cause the disease, this is not a frequent occurrence. The disease diphtheria is kept alive in a community rather by virulent organisms in immune persons than by these non-virulent bacilli. Where virulent diphtheria bacilli are present, as shown by outbreaks of the disease, cultural tests of all contacts and isolation of those showing positive cultures is a duty owed to the community. Where the disease does not exist, isolation of carriers of probable nonvirulent bacilli is of no proved benefit, and is a costly and laborious procedure entailing much unnecessary hardship on innocent and probably harmless parties. The attempt to control diphtheria in a city by a round of cultures from all school children at the beginning of the school year does not seem encouraging from this series of tests. The proposition to stamp diphtheria out of a city by cultural tests of all the inhabitants and isolation of all carriers is impossible from any practical standpoint.

Deceptive Beginning of Certain Diseases with Abdominal Symptoms.—M. d'Oelstnitz (*Arch. de méd. des enf.*, Feb., 1910) says that acute infantile diseases almost always begin with abdominal symptoms, vomiting, and pain. Meningeal reactions without causal lesions are constant in various affections, and may be demonstrated by lumbar puncture. These symptoms sometimes mask completely the symptoms of the primary disease, and cause a wrong diagnosis to be made. Pulmonary troubles in infants may begin with abdominal pain, often localized in the iliac fossa and simulating appendicitis. Pneumonia and pleurisy evolve quietly without any marked chest symptoms, and only a careful examination will bring out the physical signs. The author describes a case of measles in which this occurred. The abdominal symptoms were very intense, diarrhea, vomiting,

meteorism and pain being present. In measles there is at the period of incubation a polynuclear hyperleukocytosis, which often triples the number of white blood cells. It is constant enough to cause a suspicion of the incidence of measles when present; during the eruptive period it distinguishes measles from similar eruptions.

Causes of Limping in Children.—Savariaud (*Jour. de méd. de Paris*, Feb., 1910) says that when a child is presented to a physician with a limping gait it is most important to be able to say positively what is the cause, as an incorrect diagnosis may lead to a life-long lameness. It may be due to a difference in the length of the two legs, or in their suppleness, to a difference in strength of the muscles of the hip, or to pain caused by movements of the joint. The examination of the pelvis and the legs will fix the diagnosis. The trouble may be unilateral or bilateral. In ankylosis of the hip the gait is stiff. An affection of the foot or ankle is easily seen, but that of the hip may be concealed. When it is congenital it is probably due to luxation of the hip; when it appears after a normal gait it is generally due to coxalgia. The child is first observed naked, in the standing posture, and made to walk; asymmetry, atrophy, flexion of the knee, depression or prominence of the trochanters, and shortening are noted. The child is placed on his back on the table and the position of the legs noted, and passive movements are made so as to test limitation of motion and presence of pain on movement. The glands are examined, atrophy is looked for and sensibility of the femoral head noted. Vicious attitudes are looked for. An x-ray examination will be of value.

Nephritis of Childhood.—Hutinal (*Bull. méd.*, Jan. 29, 1910) states that nephritis is a not uncommon occurrence in childhood, and that it is generally the result of some infection. The most common form is that which follows scarlatina; but it may be caused by any of the infectious diseases of childhood. Among these are measles, diphtheria complicated with a mixed infection, severe infections of the tonsils and pharynx that are not caused by the Klebs-Löffler bacillus, intestinal intoxications, appendicitis, etc. In some cases the child has had scarlatina some years before, and the kidneys have been impaired, and thus form a place of least resistance for new infection. Under such circumstances exposure to cold has an important etiological bearing. In adults the causes of nephritis are often poisons formed within the body, as in arteriosclerosis and gout. These are comparatively rare in children, in whom the causes come from without. Gastrointestinal and cutaneous troubles are the chief causes from within. These infections occur in children who are congenitally delicate, or are weakened by some previous disease. Mumps, erysipelas, and rheumatism may cause nephritis. The symptoms are malaise, fatigue, and headache, coming on suddenly or slowly, sometimes accompanied by convulsions or coma. The amount of urine is small, it is high colored, and

thick with sediment. Edema is marked, and lumbar pain severe. The pleural cavities should be carefully examined for fluid. The edema depends not on the retention of water but of chlorides and urea. The heart is quickly affected, with increased arterial tension, dilatation, and disturbed rhythm. The author believes that the order in which these phenomena occur is this: renal impermeability, increased arterial tension, dilatation of the heart, and increase in the size of the liver. The prognosis is generally good, and the severity of convulsions is not an indication of a bad prognosis.

Cardiovascular Apparatus in Nephritis of Childhood.—P. Nobécourt and Roger Voisin (*Arch. de méd. des enf.*, Dec., 1909) record their observation of acute and chronic nephritis occurring in childhood, with reference to the cardiovascular changes present. They base their conclusions on twelve cases of nephritis occurring at the Hôpital des Enfants Malades, in Paris. Nine of these were cases of acute scarlatinous nephritis, of which five recovered; one died of pneumococcic meningitis, and three became chronic. The histories are given. The most important changes are seen in acute nephritis; here we get increased arterial tension; this disappears when the disease is cured. In long cases and when the disease becomes chronic the pressure falls. In fatal acute nephritis dilatation of the heart occurs; in long cases the increase in the size of the heart may be permanent. In old cases of chronic nephritis and in acute attacks enlargement is seen, due to dilatation. Gallop rhythm is rare. The liver is frequently enlarged. The author explains these phenomena by the increased retention of water, increasing arterial tension and weight by edema. The heart has to do more work and dilates; the liver becomes a sac of water and enlarges by blood distention. Increase of pressure and dilatation of the heart may not mean a bad prognosis; a more insidious form may be more permanent.

Tuberculosis and Tuberculin Therapy in Nurslings and Young Children.—Paul Romer (*Arch. f. Kinderheil.*, Bd. lii, H. iv-vi, 1910) gives a resumé of the observations that have been published with reference to the use of tuberculin in children. The action of tuberculin is a very delicate test for tuberculosis, and an indication of immunity to it. The physician must consider the clinical and anatomic-pathological results of its use. Heubner has declared that the use of tuberculin is contraindicated in young children. The author finds that young children bear a considerable dose of tuberculin well and are not injured by it. In the children's clinic at Cologne experiments were made with reference to the use of tuberculin in children. Records of three cases are given. It must be remembered that in infants resistance is minimized and tuberculosis early becomes generalized and ends fatally. Respiratory processes are infrequent in infants.

Usefulness of Opiates and their Harmlessness in Children.—Lust (*Ann. de méd. et chir. inf.*, Nov. I, 1909) says that opiates

are not contraindicated in infants as has been supposed, but on the contrary are of great value in spasmodic conditions. We should avoid preparations of opium which contain all the alkaloids and other principles of the drug, and should confine ourselves to morphine given hypodermically or by mouth. The tolerance of infants for this drug is equal to or greater than that of adults if its dosage is based not upon age but upon weight. Morphine is a simple, stable product, the dosage of which can be given with precision. It should be one-half milligram for every kilogram of weight in each twenty-four hours, well diluted, or one-half as much by hypodermic injection. There is no fear of accumulation, and the dose may be increased without fear.

The Genital Crisis in the New-born.—Lequeux and Marioton (*Bull. de la soc. d'obstet. de Paris*, Dec., 1909) describe the genital crisis in new-born children as consisting of swelling of the mammary glands and secretion of a milky fluid in both sexes; swelling of testicles and prostate, and secretion from the tunica vaginalis in boys, and congestion of the uterus, sometimes menstruation, in girls; increase of lanugo hairs, acne, and seborrhea in both sexes. This occurs frequently in the new-born. These phenomena are physiological, not accompanied by inflammatory conditions, and need no treatment. They may be due to an internal secretion from the placenta. Out of 1,575 infants born during one year at the Tarnier Clinic, 532 showed this genital crisis; it is more frequent in good-sized children than in the small and premature ones, and equally so in girls and boys. It generally begins about the tenth day, sometimes the fifth or sixth day. The mammary secretion consists of epithelial cells and fat globules, without bacteria, but manipulation will soon cause infection with staphylococci and streptococci from without.

Clinical and Bacteriological Observations on Streptococcus Enteritis.—Maurizio Pincherle (*Arch. f. Kinderheilk*, Bd. lii, H. iv-vi) tested the feces of children¹ having enteritis due to streptococci, as to the power of agglutination with other forms of streptococcus. Daily microscopic and cultural tests of the stools were made. The history of a case examined is given in detail; a four-days-old child was brought to the clinic in good health. It was nursed by a healthy woman and gained flesh; the stools were the normal breast-milk stools. Suddenly, after four days, dyspeptic stools appeared, which showed streptococci. The same evening the child had fever, was restless, nursed badly, and had frequent green, loose, undigested stools, slimy and rich in cellular elements. How did the streptococci infect this child? An infection during birth is unlikely. The infection must have come by means of the milk. The milk was examined and showed for three successive days a pure culture of streptococcus, similar to that found in the stools of the baby. Micrococcus tetragenus albus was also found, but was not virulent. The study of such intestinal streptococci as to their virulence is

interesting. In the mild forms of streptococcus infection of the intestine the virulence was evident. The intestinal streptococci, according to Jehle, cannot be differentiated from others morphologically, but with an immune serum through agglutination they can be easily differentiated. Fischer believes that agglutination alone cannot give the means of a differential diagnosis, but that a monovalent serum will not agglutinate all streptococci. The streptococci found in the nursing bottles of twenty-one infant out-patients did not differ morphologically from those found in the stools of the baby that had enteritis from streptococci. Experiments were made by inoculation of dogs with this streptococcus. The streptococci isolated by the author from stools of children having a light form of enteritis, those having no intestinal trouble, and those sick with other troubles were in many respects similar. They might be divided morphologically into two groups; one with diplococcus forms in short chains and one with longer chains. Injection of intestinal streptococcus caused a high degree of immunity shown by agglutination at 1-4,000; the other intestinal streptococci agglutinated in dilution of 1-250. Other sera were not agglutinated by them. Those of cow's milk were similar morphologically to streptococci from the intestine and human milk.

Presence of Diphtheria Toxins Circulating in the Blood.—Gino Menabuoni (*Riv. di Clin. Ped.*, Jan., 1910) has investigated the presence of toxins circulating in the blood, and the possibility of their being the cause of diphtheritic paralysis. He injected diphtheria toxins into rabbits, and found that they always caused a gelatinous infiltration at the site of injection. He then injected them with the blood of infants sick with diphtheria in various stages, and found that in the early stages this gelatinous exudate was produced, but that later in the course of the disease it was absent. Toxins were found for several days after the disappearance of the exudate in the throat; but later than this there was no evidence of their presence in the circulation. The membrane in the throat is accompanied with virulence of the bacilli, but when they are destroyed there are no longer toxins in the blood. Hence the paralytic phenomena are not due to circulating toxins, but to toxins that have become fixed in the cells. The toxins become slowly but stably fixed in the cells; hence the necessity of preventing this fixation by the early use of antitoxin. The avidity of the toxins for the receptors of antitoxin is greater than that for the receptors of the cells, hence the antitoxin neutralizes their power.

The Mentally Deficient Child in School.—H. B. Mills (*Pediatrics*, Feb., 1910) recommends the reduction of the school year from ten to nine months, and of the hours of the school day from five to two sessions of two hours each with two hours intermission, and the discontinuance of all home work. He urges the physical examination of every child at the opening of the school term in the fall and regularly every three months there-

after for the detection of adenoids, enlarged tonsils, impaired vision and hearing, etc. Teachers should be instructed to make careful note of the mentally backward child, and to report the same to the principal weekly for one month, at the end of which time, if there be no improvement, the child should be referred for medical examination as to its physical and mental condition. The writer favors the establishment of special schools, or special classes in different parts of existing schools, for the mentally backward children, each child to be graded according to its mental capacity, regardless of size and age. There should be separate classrooms for the boys and girls, and separate schools or at least separate classrooms in the different parts of existing schools for members of the colored race. Careful inspection of the home life and surroundings of a mentally deficient child, especially as to heredity, and the character and calibre of the parents, is called for. The report of the school physician or of the family physician should be taken individually or collectively as final, so that a child's mentality may not be passed upon by incompetent laymen. Male teachers are best for boys and female teachers for the girls, with preferably a male supervising principal in all mixed schools. All difference of opinion occurring between the family physician and the school physician as to the child's mentality and grading, should be settled by reference to a third physician, to be mutually agreed upon by these two. Classes should be conducted in the open air as far as possible in all suitable weather. The standing of a backward child should be reported frequently to the parents by the teacher.

Immediate and Remote Results of Resection of the Knee-joint in Children for Tuberculous Lesions.—Pietro Calcagni (*Gior. Internaz. d. Sci. Med.*, Jan. 31, 1910) reports the cases which have been operated on for knee-joint tuberculosis, during the last ten years, at the Naples Hospital for Incurables. They number 102 in all; of these eighty-nine were resected, of which seventy-five cases resulted in a complete cure, and seven were obliged to submit to secondary amputation. Eight had primary amputation; five were treated with the cautery and immobilization; two died of intercurrent disease. These were the only cases that died. The histories of all the cases are given, and photographs of the condition before and after operation in several cases. When a cure has been obtained and a deformity has resulted the author operates to correct the deformity, which is contrary to the general custom, but has been successful in his hands. A wedge-shaped piece of bone is removed in such a position as to straighten the leg.

Fractures of the Diaphysis of the Femur in Children.—M. Binet (*Gaz. des hôp.*, Jan. 27, 1910) says that the fracture of the leg that is most frequent in children is that of the middle of the shaft of the femur. In the young child it may be subperiosteal, and a green-stick fracture is not infrequent. As the child grows older we find tearing of the periosteum and displacement of the

fragments as in the adult. The upper fragment, drawn upon by the psoas muscle, points forward and outward, giving an anteroexternal convexity. The axis of the leg is rotated outward. There are three methods of treatment; continuous horizontal extension, continuous vertical extension, and manual reduction with application of an apparatus to keep the leg in place, preferably plaster. The immobilization in the child must be very firm, because the child will rid himself of all restraining apparatus if he can. The third method mentioned is preferable to the others, because the child need not be kept in bed, but may lie in a long chair. Plaster is easy of application and very firm. After twenty-four hours the splint may be left without supervision. The fracture is united in about five weeks, and then massage and passive movements should be given. Horizontal extension for a period of about fifteen minutes before the application of the plaster will be sufficient.

Occurrence of Adenoids.—Macleod Yearsley (*Brit. Journ. Child. Dis.*, Feb., March, 1910) has investigated this subject in three London elementary schools with an attendance of 2,315. He concludes that on the average about 37 per cent. of the children in elementary schools have adenoids, and that between 72 and 76 per cent. of these have enlarged tonsils as well. On the average, 31.2 per cent. of adenoid cases are mouth-breathers, complete or partial, and that hypertrophy of the faucial tonsils may give rise to mouth-breathing in the absence of adenoids. Sex appears to have no influence upon the incidence of adenoids. Adenoids are more common about the age of eight years, and are next most frequent at about twelve years. True aprosexia is often confused with apparent dullness due to defective hearing, and it occurs in only about 4.7 per cent. of adenoid cases, is more frequent in girls, and, when present, is associated with a marked degree of adenoids. The so-called adenoid facies is uncommon, except in association with a marked degree of adenoids. The association of an abnormally high palate with adenoids is rather due to peculiarities of cranial formation than to extrauterine influences of nasal stenosis, and, if there is any relation between a high narrow palate and adenoids, it is possible that the palate shape is rather a cause of adenoids than *vice versa*. The presence of adenoids has more to do with the presence of carious teeth than have mouth-breathing and palate shape, and this is probably due to the increased tendency to oral sepsis in adenoid children. Irregularity of the upper incisors is less a result of adenoids than of palate shape. The percentage of ear complications in adenoid children is about 10.8, and adenoids are probably by far the most important factor in the etiology of ear affection in childhood.

Nephritis of Childhood.—Hutinel (*Bull. méd.*, Feb. 5, 1910) says that in acute scarlatinal nephritis all parts of the kidneys are involved in the inflammatory process, cortex, vessels, and epithelium. It is a pure diffuse nephritis; the vascular alterations are

curable, and their predominance explains the good prognosis of this form of nephritis. Parenchymatous nephritis is almost always due to infection; the severity depends on the virulence of the germs and the length of time during which they are active. A short period of active virulence is more easily recovered from than a long period of feeble activity causing renal sclerosis. Exposure to cold is the cause of a more severe infection. It is most important to keep the child from changes of temperature. This form of nephritis rarely becomes chronic. But a sensitiveness on the part of the kidneys may remain for years after it. Prognosis is better in the acutest forms, and when the urine shows less severe lesions. There may be anuria, oliguria, or hematuria. Loss of weight and failure of general nutrition are of bad prognosis. Intermittence is also characteristic of this form of nephritis. Another interesting condition is the latency of these lesions in some cases. Children easily resist severe kidney lesions and recover from conditions that would be fatal in adults. The fresh, new epithelium repairs easily; reaction in the form of vasodilatation occurs, with interstitial edema and anasarca. The treatment consists of water diet for two or three days, with absolute rest in bed. Then milk diet for a certain time, but not so long as to cause anemia. This is followed by a diet containing milk and vegetables, and finally white meats are added in moderate amounts. A diet with very little salt is used in long and obstinate cases. It consists of carbohydrates, fats, and nitrogenous substances in small amount. The functions of the skin should be stimulated by baths and friction. The mouth, nose, and pharynx should be disinfected. In acute conditions with anuria dry cups are valuable, as well as hot packs. Theobromine is a good diuretic. The great dependence should be placed on the milk diet and general hygienic measures.

Appendicitis in Children.—Discussing the peculiarities of appendicitis in children, C. N. Dowd (*N. Y. State Journ. Med.*, 1910, x, 100) says that even those surgeons who have advocated delay in certain adult cases advise immediate operation in similar children's cases, fearing the insidious spreading form of peritonitis which they occasionally have. For the diagnosis of appendicitis in children one must depend chiefly upon sensitiveness, which becomes localized in the appendicial region. Muscle rigidity is the main evidence of its presence. Since children's abdomens are small, and their appendices often relatively long, sensitiveness at a distance from McBurney's point is more common than in adults. Of the conditions which simulate appendicitis the writer mentions beginning pneumonia, general peritonitis of unknown origin, tuberculous, pneumococcic and diffuse gonococcic peritonitis, foreign bodies in the appendix or peritoneal cavity, hip disease, and cyclic vomiting. The author's cases consist of a group of seventy between the ages of two and fifteen years, reported in 1905; operation within forty-eight hours of onset of symptoms in 15.7 per cent. of the cases, with a mortality

of 10 per cent.; fifty operated upon between that date and September, 1907, 16 per cent. of which were done within forty-eight hours, with a mortality of 8 per cent., and sixty-one cases since that date, of which 36.1 per cent. were operated upon within forty-eight hours. These sixty-one cases gave no mortality. In the three groups there were forty-one operated upon within forty-eight hours with only one death. The general trend of recent surgical procedure and that employed by the writer is to simplify technic, make the incisions well to the side, remove the appendix when practicable and drain the local abscess if there is one, but neglect the general peritoneal cavity and not manipulate or disturb the intestines therein. If the appendix could not easily be separated it was left undisturbed. The complications from this method of treatment have been surprisingly few. An occasional secondary operation has been needed for the removal of an appendix. The secondary abscesses in other parts of the abdomen have not been as frequent as when more manipulating was done there. The period of childhood is believed to have a marked bearing on the prognosis, the younger children being less favorable than the older. This difficulty, however, applies rather to the diagnosis than to the treatment, since young children endure simple operations very well.

Scarlet Fever Prophylaxis with Streptococcus Vaccine.—R. M. Smith (*Arch. Ped.*, May, 1910) calls attention to the favorable results reported by a number of Russian physicians. In all, over 50,000 vaccinations have been performed. The vaccine is a concentrated bouillon culture of the streptococcus isolated from a person ill with scarlet fever, killed by heating to 60° C., with the addition of 0.5 per cent. carbolic acid. The dose is 0.5 c.c. in children two to ten years old, modified from this according to age. The contraindications for use are nephritis, very young or greatly exhausted individuals and possibly high temperature. It is claimed that after three doses of the vaccine, given at seven to ten day intervals, a complete immunity is established against scarlet fever. The duration of this immunity is believed to be at least one and a half years. In the majority of cases there is some local reaction at the site of inoculation, consisting of a small area of redness and infiltration with some pain and tenderness lasting one to three days. There is usually also a little rise in temperature, some headache, and general malaise. In from 10 to 15 per cent. of the cases, twenty-four hours after the injection there appears on the chest and abdomen a punctate erythema very much like the eruption of scarlet fever, but not followed by any desquamation. This eruption lasts one to three days and may be accompanied by sore throat, some swelling of the lymph glands and often the so-called strawberry tongue. After the first injection the reactions are very slight, if any.

Streptococcus of Scarlatina and the Reaction of Fixation.—Ch. Foix and Et. Mallein (*Presse méd.*, March 26, 1910), after examination of the streptococcus of scarlatina in twelve cases, obtained

83 per cent. of positive tests of the agglutination reaction. This has been confirmed by the experiments of Schliessner, who in the same way obtained 81 per cent. of positive reactions. He concludes that the serum of the scarlatinous contains antibodies which act against streptococci, which can be easily isolated both from the throat and the blood in the course of the disease. These antibodies may be placed in evidence by the reaction of fixation in the great majority of cases. The reaction of fixation evident in scarlatina is absolutely negative to other streptococcemias, especially erysipelas. Thus the individuality claimed by Berge, Moser, and Gabritchewski for the streptococcus of scarlatina is confirmed by the authors.

Epilepsy in Children and its Treatment with Bromide.—Paul Boncour (*Prog. méd.*, March 19, 1910) thinks that, although the bromide treatment is the best for epilepsy, its success depends greatly on the method of administration and the attention given to the details of diet and hygiene. It is indicated in all cases in which convulsions are present and should stop all motor phenomena, but in cases of petit mal, without any convulsive movements and of mere dizziness, it is less successful. The cause of the attacks should be carefully sought out and as far as possible removed. A daily history card kept by the parents is a great aid to the physicians in the knowledge of the number and type of convulsions, and thus of the effect of bromides. The bromide must be given in sufficient quantity and for a sufficiently long time, generally for several years. The author prefers a mixture of the three bromides, sodium, potassium, and ammonium, to which he adds in some cases calcium bromide. The dose must be carried up to a point at which the motor manifestations are controlled without marked bromism, and must then be kept at that point for months or years. Irregularity and lowering of the dose without permission is responsible for most of the failures. A great aid to the effect of the treatment is given by restricting the amount of chloride of sodium that is used with the food to a small quantity. The bromide is then effective in smaller doses. It should be continued three years after the last attack.

The Congenital Mongolian Blue Spot.—E. Apert (*Presse méd.*, March 26, 1910) describes a peculiar bluish spot that is found over the sacrum or a little higher up in children who are of the Mongolian races or have a taint of Mongolian blood. This is caused by pigment in the deeper cells of the skin. Pressure upon the skin does not cause its disappearance. It is rarely seen in the European races. In the negro it is absent. In form it is generally oval. The deep cells of the derma contain black pigment. The practical considerations connected with the study of this phenomenon are the fact that we can state to the parents of a child who shows this mark that it is not abnormal, and has no pathological significance, and that it will gradually disappear of itself before the age of puberty.

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ORIGINAL COMMUNICATIONS.

CANCER OF THE UTERUS.*

AN ETIOLOGICAL STUDY BASED ON CLINICAL STATISTICS.

BY

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THE conceptions of the genesis of cancer may be divided chronologically as well as in accordance with the different theoretical tendencies in medicine into three periods. The first period embraces the time from Hippocrates to Schwamm and Virchow's discoveries of the cellular organization of the animal body. The second period covers the time from Virchow until the beginning of the experimental cancer research of the last decade, and the third begins with Jensen's publication in 1903.

In the time before Virchow, cancer was considered a general disease, a diathesis; the tumor itself was something entirely foreign to the organism, a parasite. Johannes Miller and Virchow were first to indicate that cancer consists of normal body cells and completely resembles morphologically benign tumors. The principal feature differentiating the two consists in the unlimited cell proliferation of a malignant tumor.

Since pathology did not possess until recently any method for reproducing cancer on a lower animal, every hypothesis created to elucidate the pathogenesis of cancer must of necessity have

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Statistical material for this investigation collected at the expense of the George Crocker Special Research Fund, Columbia University.

been a purely philosophical one. Virchow himself was of the opinion that the limitless cell proliferation was caused in every instance by an external irritant extrinsic to the cell. Cohnheim laid the main stress on the intrinsic abnormality within the cancer cell. According to his theory the formation of a cancer always begins from an embryonic cell, arrested in its development. Ribbert goes still further in this conception of an intrinsic cause for the proliferation of a cancer cell. He believes that every cell has an innate capacity for proliferation, but it is restrained by the cellular correlation of the rest of the organism. Should this restraining influence cease, the cell begins to proliferate—a malignant new growth forms.

This theory explains readily many factors in tumor formation and if corroborated experimentally would have been of great value. Several investigators have tried to approach this question experimentally. The writer,⁽¹⁾ in a series of experiments, tried in a variety of ways to free cells from the restraining influence of the rest of the organism under conditions most favorable for their subsequent proliferation. The results of all these experiments were uniformly negative.

There is no need of going deeper into an analysis of these and all other theories of the pathogenesis of cancer. They all leave unanswered the main problem, namely the primary cause or causes which either change the cell itself or the restraining influences of the rest of the organism.

The discoveries that meanwhile took place in bacteriology and infectious diseases made it appear feasible that cancer may also be a parasitic disease. An immense amount of research was done in this line in the last two decades, but without adducing any actual proof for the parasitic theory of cancer.

A new era was opened in cancer research when it was shown by Hanau⁽²⁾ and Morau⁽³⁾ in 1889, and with still more precision by Jensen⁽⁴⁾ and Loeb⁽⁵⁾ in 1901, that it is possible to transplant carcinoma and sarcoma of white mice and rats into other animals of the same species. Here was at last a method to reproduce artificially cancer in lower animals and consequently change cancer research from philosophic speculation into an exact experimental science. Since then the experimental work on the transplantable tumors of lower animals is being pursued vigorously in nearly every center of medical learning, and many results of great value were obtained.

The most interesting phenomenon observed in the course of

these investigations is the difference in the susceptibility of different animals to the growth of an implanted tumor. When the original spontaneous tumor is implanted into other animals, it usually grows only in a limited number, often not more than in 10 per cent. of the animals used. In subsequent implantations, when an artificially grown tumor is used for inoculation, the implantations gradually become more successful. In other words the adaptability or virulence of the tumor cell gradually increases. On the other hand it was noticed that the race of the animal and its mode of life have an important bearing upon the success of the implantation. Thus these investigations indicate that the growth of the implanted tumor depends upon the correlation between the virulence of the implanted cell and the resisting power of the organism of the host. It was further shown that an immunity or resistance to the growth of a transplantable tumor may also be induced artificially. Ehrlich,(6) who did the most important work in this line, proceeded in the following way: He inoculated animals with a tumor that was known to possess a low virulence. In the majority of the experimented animals this tumor would absorb without producing a growth. Such animals appeared to be then immune against the majority of the other strongly virulent inoculable tumors. This phenomenon Ehrlich calls *pan-immunity*. The same kind of an immunity may be artificially induced by previous inoculation of normal tissue (liver, spleen, blood). This resistance is of a peculiar type and is not similar to any known form of anti-bacterial immunity. Ehrlich and most other workers in this field seemed to be of the opinion that this artificial resistance can only be induced by previous treatment with uninjured cells.

The writer's(7) studies on artificially induced immunity to growth of cancer have shown that identical results may be obtained by treatment with autolyzed tissue, *i.e.*, with tissue of which the cells are killed in such a manner as to leave the endocellular enzyme-like substances uninjured and active.

Another exceedingly interesting phenomenon observed in the course of these transplantations is the transformation of carcinoma into a sarcoma. Ehrlich and Apolant(8) first noticed that a carcinoma of a white mouse on inoculation into subsequent generations, changed into a sarcoma. The same fact was observed by Bashford,(9) Loeb,(10) and several other investigators. This transformation can only be explained, according to Ehrlich,

by the influence of a certain peculiar chemical stimulus emanating from the implanted carcinoma cells on the connective tissue of the host. Under this influence the connective-tissue cells are transformed into sarcomatous cells, while the implanted carcinoma is suppressed. The writer(11) has shown in a recent paper that the connective-tissue cells of a white rat are apt to respond more readily to various stimuli by an increased proliferation of connective-tissue cells than other laboratory animals. It is thus demonstrated that normal connective-tissue cells may change into sarcomatous cells and become malignant through the influence of an extrinsic stimulus emanating from an implanted carcinoma cell.

Should we consider, then, the results obtained by the aid of the experimental cancer research, it will be seen that data of great importance have been acquired.

Artificial immunity to the growth of cancer can be induced in small animals by previous treatment not only with living cells, but with chemical, possibly ferment-like constituents of the latter. But to induce an immunity to cancer growth may indicate the way to rational treatment of cancer, since such an immunity would prevent the occurrence of metastases, after the primary tumor is removed. Nevertheless, it is self-evident that the results obtained cannot be transferred yet to human pathology; even the experimental part of the research will require a great deal of work before it is placed on a firm foundation. But the investigations are only a few years old and if the number of the investigators engaged in this field of research and the intensity of their work is considered, there cannot be any doubt that results of still greater value will be obtained in the near future.

The recent investigations of specific cure of cancer on treatment with ascitic fluid obtained from cancer patients, or by specially prepared tumor emulsions, are as yet in an empirical state, but this again indicates work in the right direction.

On the other hand, it must be admitted that experimental cancer research did not succeed as yet in elucidating the main problem in cancer, the etiological moment, which causes a certain group of cells to proliferate indefinitely and consequently gives rise to cancer. Ehrlich,(12) one of the ablest investigators in this field of research, writes in this connection in one of his most recent articles as follows: "All these considerations leave the main question of etiology untouched. . . . I do not believe

that this question will be answered so soon by the experimental science, nay, I doubt exceedingly whether this question can be answered at all in a uniform manner." The experimental research has so far only indicated how to search for this primary cause, it has proven that any normal cell can be transformed into a malignant cancer cell by the aid of an external irritant, and, further, that a cancer cell may proliferate and retain its malignancy when introduced into one host and become innocuous and cease to proliferate in another host. Consequently the formation of a cancer is the result of the interaction between a certain external irritant and the constitutional reactivity of the individual. Unless, then, a uniform specific irritant causing the formation of cancer of a parasitic nature is discovered, and all our present knowledge seems to speak against it, we have to search in every individual case of cancer for a different irritant and also for different constitutional conditions within the host. Indeed if a study is made of various cases of human carcinoma or sarcoma as they occur in the clinic or at the autopsy, it will be manifest that their formation is due to different etiological moments.

Malignant tumors of the bladder, which develop in a certain number of aniline workers, are apparently due to the irritation of the mucous membrane of the bladder by the oil. Carcinoma of the skin of the abdomen, found among the natives of Kashmir, is caused by the chronic thermic irritation of the skin by the small earthenware oven which the natives wear in winter near the skin. The cause of the carcinoma following X-ray exposures is manifest. And still not all individuals exposed to these irritating influences develop the disease, thanks to their different constitutional reactivity, which was mentioned above, and the true nature of which it is exceedingly difficult to discover. Again, in hypernephroma or other conditions, where the malignant proliferation begins in a group of embryonal cells, the influence of an external irritant is not apparent at all. In these cases it is feasible to consider in the sense of Cohnheim's theory, that the power to proliferate always existed in this group of cells and only at a certain period of life of the individual the constitutional reactivity of the host changed so as to remove the restraint.

It is self-evident, then, that not only cancer in the different species of animals, but the various cancers within the same species may have developed under the influence of different

causes; consequently the etiology of human cancer can be elucidated only by its study on man. The study of the etiology of a disease, on the other hand, does not possess only a theoretical academic interest, but is of ultimate practical value, since it is the only way to learn the methods of prevention. Thus the only possible method for the investigation of the etiology of human cancer remains in the detailed study of a large number of clinical cases, in other words, the method of clinical statistics. Such a statistical investigation is different from pure vital statistics, which is largely employed in the study of cancer. In vital statistics the aim is to find the complete number of cases of death in a given territory during a given period of time, usually a year or a month, or else the complete number of cases of disease on a certain day in a given territory. By the aid of this method knowledge may be gained as to the age at which cancer most frequently occurs, the prevalence of a certain sex, the fact that the occurrence of the disease seems to increase in civilized countries. But for the study of the etiology of cancer vital statistics are of comparatively little value. For the purpose of this study a thorough analysis must be made of each case of cancer, an analysis aiming not at therapeutics or prognosis, but at the primary causes, as they may be gathered from the data of the anamnesis, from the complete life-history of each patient.

With this object in view, a statistical investigation was instituted by the George Crocker Special Research Fund of Columbia University. During the last six months 4,000 cases of carcinoma and sarcoma were collected and analyzed. The methods employed in the investigation and the complete result of the analysis will be reported elsewhere. Mention shall be made here only of a few salient points.

The analysis revealed the fact that all cases of cancer may be divided into two large groups. The first group presents cancer of the skin, extremities, mouth, etc., in a word, external cancers, in which the influence of an external irritant is very apparent. The second group consists mainly of the cancer of the parenchymatous organs (stomach, liver, etc.). In this group the influence of an external irritant is not so clear and the constitutional reactivity of the patient seems to be the most important causative factor. It is interesting to note in this connection that in primitive races the first group prevails, while in civilized countries the reverse holds true. Another

interesting factor is the relative frequency of the occurrence of an hereditary disposition in these two groups; while it is indicated, for instance, in 6 per cent. of the cases of cancer of the esophagus, it is mentioned only in 1 per cent. in cancer of the extremities. On the other hand, the reverse is true for the incidence of the occurrence of a disease or trauma previous to the onset of cancer in the organ. This condition is met with in 1 per cent. in cancer of esophagus and in 38 per cent. in cancer of the extremities.

With these preliminary statements, we can pass to the more detailed analysis of the cases of cancer of the uterus.

The cervix is the part of the uterus most frequently affected with cancer, and since the majority of the cases present women who have born several children, the opinion prevails among gynecologists that traumatisms of labor are the most important predisposing influences in the production of the disease. In view of this, repair of cervical lacerations is urged as a preventive measure. Miller,(13) in a recent article, goes as far as to say that repair of these lacerations restores the parts to a normal state with as slight disposition to cancer as in the nulliparous state. On the other hand, in cancer of the body of the uterus, a condition less frequently encountered, it is admitted that parturition does not seem to play any rôle. Cullen, in an analysis of nineteen cases of carcinoma of the body of the uterus, found that ten of the patients never had any children. Theilhaber(14) asserts that the cause of the cancer of the cervix lies in the lacerations with subsequent anemia of the scar, while the cancer of the body of the uterus takes place in women of more advanced age and is due to the general anemia of the uterus. But at the same time he admits the influence of racial characteristics and mode of life.

Our study is based upon an analysis of 613 cases of cancer of the uterus collected from the foremost metropolitan hospitals, which presents a number much higher than any that served as the basis for the deductions of previous writers. The scientific standing of the institutions precludes any doubt as to the accuracy of the data collected, but on the other hand, certain data of great value for the study of the etiology of the disease are lacking, due to the fact that the main object in the taking of a history in a hospital is the prognosis and therapeutics. As an instance may be mentioned the question of occupation. In a married woman it will be usually stated that the occupation

is house work, while it is of greatest importance to know the occupations of the patients since childhood and certainly since puberty. We hope to overcome these difficulties in our future studies on patients still under the care of the surgeons.

The material was analyzed and tabulated with the aim to consider the different factors which may have a certain bearing on the etiology of the disease, and a comparison was always made between the cervix and the body of the uterus. As stated above, it is claimed that cancer of the body of the uterus usually occurs in a more advanced age than cancer of the cervix. The analysis of Table I shows that while there is a slight difference it is not sufficient to be an etiological factor:

TABLE I.

Age	Cervix	Per cent.	Body of uterus	Per cent.
20 to 34 years.....	61	13	11	8
35 to 44 years.....	146	31	30	21.5
45 to 60 years.....	230	49	77	55
Over 60.....	35	7	18	13
Not stated.....	2	....	3	....

TABLE II.

	Cervix	Per cent.	Body	Per cent.
Hereditary disposition indicated.	38	8	11	8

TABLE III.

	Cervix	Per cent.	Body	Per cent.
Previous disease of the cervix mentioned.	12	2.5	7	5

Table II shows that the number of cases where hereditary disposition was indicated, while small, corresponds close to the ratio found in cancer of parenchymatous organs, than in external cancer. The same is true for the comparative infrequency of the occurrence of a previous disease of the organ, as seen

from Table III. It was stated above that in external cancers, the frequency of a previous disease is found as often as in 41 per cent.

TABLE IV.

	Cervix	Per cent.	Body	Per cent.
Fibroid found in the uterus	23	5	2	1.5

J. T. Williams,⁽¹⁵⁾ E. McDonald,⁽¹⁶⁾ and many others claim that there is a distinct etiological relationship between fibroid and cancer of the uterus. Table IV seems to indicate that the relation is only accidental, and indeed the investigations of O. Lubarsch⁽¹⁷⁾ and other pathologists have shown that the genesis of fibroids and cancer is entirely different, the former presenting more of a malformation than a tumor.

Table V shows that while the cases of cancer of the uterus in virgins comprise 8.5 per cent. of all the cases of the body of the uterus and only 4.5 per cent. of all the cases of the cervix, the influence of child-bearing generally does not seem to differ much in the two conditions:

TABLE V.

Conditions of child-bearing	Cervix	Per cent.	Body of uterus	Per cent.
Virgin.....	21	4.5	12	8.5
0-para.....	13	2.8	6	4
1-para.....	56	12	14	10
Multipara.....	279	56	73	52
Married.....	105	....	34	....
No statement in regard to child-bearing.....	8	....	2	....

Nor does child-bearing as a whole seem to have the direct etiological bearing on the disease which is ascribed to it. It is true that the number of cases of cancer in married women is a great deal higher than in single women, but so is the general ratio between married and single women during cancer age. The following is a table compiled from the twelfth United States census of 1900:

TABLE VI.

Died in 1900 at the ages 45 to 54 years

	Married	Single	Ratio
From all causes.....	23,719	3,410	7:1
From cancer	3,137	409	7.5:1

The ratio between married and single women that died in 1900 is nearly the same in cancer and other diseases, and compares favorably with the number of cancer cases in our material in virgin and sterile women. It may be interesting to note here in connection with the advice to repair lacerations as a preventative of cancer, that in two of the cases of cancer of cervix the lacerations were repaired. Two cases is rather a small number, but the percentage of lacerated cervixes that become cancerous is also probably small. Another factor of importance ascertained in the course of this investigation, which speaks against the great influence of child-bearing on the causation of the cancer of the uterus, is the practical immunity of the American Indian race to cancer. Indian women are just as fertile as their white sisters, while the deliveries take place under conditions very unfavorable to future health, the woman usually leaving the bed on the same day. Very frequently an Indian woman gives birth on the march and right after delivery follows her husband. Such conditions must undoubtedly create various lesions in the uterus. Dr. P. M. Jones(18) states that he has seen many cases of ovarian degenerations and uterine displacements among Indian women. A. F. Currier(19) writes as follows: ". . . we can fairly presume the existence of the entire class of pelvic diseases which result from infection, deformity, maldevelopment and faults of circulation. . . . The malignant diseases of the reproductive organs seem almost unknown among Indian women."

It must be admitted, then, that normal physiological conditions of menstruation, child-bearing, and menopause hardly give rise to cancer, nor is the traumatism incidental to parturition sufficient to account for it. There must be something in the life of a civilized woman which accounts for the prevalence of cancer and for its continuous increase in frequency in civilized

nations, something which a primitive woman is not subjected to. It is hardly necessary to enumerate here all the peculiar conditions of life of a girl and a woman in a civilized community which tend to decrease both the general resistance of the body as well as the resistance of the generative organs. The aim of our future work should consist of the search for the exact conditions within our civilized life which tend most to decrease the resisting powers of the organism against the formation of cancer. Only when these conditions are clear, shall we have a better understanding of the etiology of cancer and consequently of the means of prevention of the disease.

Our present knowledge indicates only that by prophylaxis in cancer of the uterus is meant the observance of the hygienic measures during the time of puberty, menstruation, and the sexual life of a woman generally, all of which is apparently more important than the repair of lacerations.

But when all is said, we have as few actual facts in regard to prevention as to etiology, and consequently we must as yet have recourse to early diagnosis and early treatment of the disease. We have indicated above the work pursued in the laboratory with the final aim to find a rational treatment for cancer. In view of the obscurity of the early symptoms of the cancer of the uterus, the insidiousness of its onset, and the frequent difficulties of making a microscopical diagnosis from material removed by curettage or excision, it is very important to obtain a specific method for diagnosis. A great deal of laboratory work is done in this connection, and though not final, the results are promising.

Thus we see that the hope for the solution of this most difficult task in pathology and medicine, the cancer problem, lies in the complete co-operation between the clinic and the experimental research on lower animals.

It was stated above that this work of collection of clinical data on the etiology of cancer is still pursued and that much better results are expected when surgeons and gynecologists in this country will take pains to collect as complete a life history of their patients as it is possible to obtain.

Below is given the form of cancer schedule used in this investigation, which will be gladly furnished on request. We also offer to the profession free examination of tumor tissue sent to the department.

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- 437 WEST FIFTY-NINTH STREET.

THE COLUMBIA UNIVERSITY SPECIAL RESEARCH FUND.

DEPARTMENT OF PATHOLOGY.

CANCER SCHEDULE.

No.

1. Attending surgeon, Dr.

2. Place and date of record

 (State address of attending surgeon or name of hospital)
3. Name of patient or initials.....
4. Sex.....
5. Age
6. Single or married.....
 (If female state whether patient had children or miscarriages)
7. Race or nationality
 (Astraloid [Coolies of East India], Negroid [Negroes, Negritos of the Philippines],
 Mongoloid [Chinese, Japanese, American Indians, Philipinos], Melanochroic
 [Italians, Spaniards, Greeks, Arabs, Jews], Xanthochroic [Fair Europeans].
 State not only the name of the race, but also of the subdivision)
8. Place of birth
 (State not only the country, but also the town or village where the patient was born)
9. Residence, etc.....
10. Occupation
 (Pay special attention to occupation, involving use of chemical [anilin, paraffin,
 tar, etc.], physical [x-rays, radium, excessive heat, electricity, etc.], or
 mechanical irritants)
11. Diet

 (State whether the diet is composed chiefly of vegetables, fresh fish, fresh meat,
 salted fish, salted meat)
12. Habitual use of drugs.....
 (Alcohol, tobacco [chewing, smoking pipe or cigar], opium [opium smoking or
 morphium injection], cocaine)
13. Previous general diseases.....
 (Tuberculosis, lepra, arteriosclerosis, syphilis, gonorrhea, etc.)
14. When were the first symptoms of the disease observed?.....

15. On what data or symptoms was the diagnosis made?.....

 (If the diagnosis was made at an operation, autopsy or microscopically, specify
 so and state the exact anatomical diagnosis)
16. What organ was primarily involved?
17. Was the same organ previously diseased or subjected to trauma?

 (As instances of such previous local diseases important in the study of the etiol-
 ogy of cancer may be mentioned leucoplasia of the tongue, mastitis, lupus of
 the face, nævi, scars or leprous nodules of the skin, gall-stones, round ulcer of
 the stomach, varicose ulcers, old fractures of bones [osteosarcoma], etc.)
18. What organs became subsequently affected?.....

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19. Did any other tumor develop on the same patient?.....

20. Were there any other cases of cancer in the patient's family?.....

(The family may mean grandparents, parents, brothers and sisters, man or wife, children. State relationship to patient and organ primarily involved)

21. Were there any other cases of cancer in the same house or neighborhood?.....

(State time, place, and organ primarily involved)

22. Was there a retrogression of the tumor?

(After treatment—operation, x-ray, radium, fulguration—or spontaneously)

R E M A R K S.

WHAT MAY WE NOW TELL THE COMMUNITY REGARD-
ING CANCER?*

BY

EUGENE COLEMAN SAVIDGE, M. D.,
New York.

It is estimated that 80,000 unsuspecting people in this country, apparently well at this moment, will be afflicted with incurable cancer in six months. These are Crile's figures.

It would be important to these to establish that there is a recognizable pre-cancer stage.

Has cancer an antecedent stage in which it may be prevented or cured? What special conditions favor the development of cancer? These are vital questions.

In "The Cancer Problem," published two years ago (*Medical Record*, May 2, 1908), the present writer gave reasons for belief in a pre-cancer stage; pointed to the relation between glandular activity, ferment integrity, and cancer; dwelt upon the possibility of making the organism cure its own cancer; and announced a half-conviction that this had been done.

* Read before the New York Obstetrical Society, April 12, 1910.

Exactly one month later Crile published his memorable paper, under identical title, likewise announcing belief in a pre-cancer stage, and giving the result of his study of the blood of cancer subjects.

September 4, 1909, Dr. E. F. Bashford, Director of the Imperial Cancer Research Fund, published his report of that body.

And February 26, 1910, Hodenpyle published his intensely significant account of a patient who did cure herself of her inoperable and apparently fatal cancers, and whose ascitic fluid has had an arresting or modifying effect on other cancers, now being studied.

Therefore there may, indeed, be an antecedent stage to cancer. Cancer may depend vitally upon condition. Cancer may have been cured by the organism growing it, in other cases than that reported by Hodenpyle.

But while debating the unknown we can point out certain known avenues of cancer approach, many of which can be blocked.

The time limit will permit only a bare deduction, and a quotation to prove it—principally from Director Bashford's report, cited above.

The Imperial Cancer Research Fund in seven years has studied 200,000 mice. It has sixty different species of cancer growing. It is still growing the identical cancers which have been transplanted through four successive generations of mice. It fires the imagination to see proved a relatively immortal living entity, nourished by a great-grand-sire's blood, transplanted and retransplanted, and still promising a continuous life. I quote:

"Seven years ago no one conceived it possible that portions of the mammalian organism could be kept growing for a period four times the life of the whole animal."

Could this same process succeed in an antithetical benign sense, no sound organ—from adrenal to brain—would ever be interred with our accidental dead, but instead transplanted upon the living defective.

AUTHORITY.—Capable men, studying sufficiently ample material, with scientific method of recorded observation and honest intent in collating and reporting, bring us as near final authority as human intelligence can get in an evolving question. Such is the source of my quotation for deduction.

IDENTITY OF HUMAN CANCER WITH TRANSPLANTED CANCER IN MICE.

Director Bashford says:

"The experimental production, at will, of the lesions of carcinoma and sarcoma, has to-day become a mere matter of laboratory routine. . . . With the lapse of time the material accumulated has made the demonstration of the anatomical lesions and clinical features more and more perfect, and to-day it lacks nothing in completeness."

CANCER IS A DISEASE OF AGE.

"The age incidence of cancer reveals a law applicable to all vertebrates. Statistically, cancer is a function of age; and when considered biologically, a function of senescence."

CANCER CANNOT BE INOCULATED UPON THE AGED.

The seeming contradiction in the following is very important. It may disclose the whole secret of the pre-cancer stage:

"Old mice are less suited for transplanting than young. . . .

"Old mice cured themselves in four weeks. . . . There is more rapid growth in the human subject when developing in the young.

"Senescence is not necessary for cancer's continuous growth.

"Old age itself renders mice absolutely resistant to the inoculation of cancer.

"The growth is frequently terminated by the immunity which the tumors induce against themselves."

THE RELATION OF CONDITION TO CANCER.

Age brings complete immunity to inoculation. The fact is simply cited here with reference to condition and cancer. The seeming contradiction will be treated later.

Age brings complete immunity; complete immunity is a condition; and how to get that condition under control is the problem for the expert.

THE INTERMEDIATE STAGES OF CONDITION.

But what of these intermediate stages of condition when the battle wages across the frontier of immunity and back again into susceptibility? I quote from source cited:

"Propagable tumors inoculated into mice with spontaneous tumors caused the spontaneous tumors to outstrip the inoculated tumor."

This certainly shows the relation of changed condition. Again:

"Repeated transplantations aided the process (in the new mice) with yet no progress taking place in the mouse yielding the mother tumor."

Some soil is therefore more inviting than other soil for the same cancer. Again:

"As yet we have not got much beyond defining that the cancer cell has many of the properties of rapidly growing tissue, without containing anything extraneous, and without secreting anything directly deleterious to the organism."

The present writer will later cite a distinct minus quality in the cancer cell. Continuing:

"There is no evidence of toxic products (from propagated tumors) injurious to the hosts; *on the contrary*, there is a compensatory enhanced vitality on their part. . . . In the end compensation breaks down, and finally the tumor lives at the expense of the host. . . . The host becomes an assimilative and excretory apparatus for the tumor."

COMPENSATORY ENHANCED VITALITY IN CANCER.

This observation is very important. The very superficial sense of well-being—like the exaltation of the initial fever—is not only one of the phases of the pre-cancer condition, but also a proof that the organism is fighting and checking the cancer up to a certain point.

THE CACHEXIA AND THE CANCER.

The cachexia is the recognizable symbol of vanished immunity, abandoned resistance, and the arrival of the hopeless malignancy. Unfortunately this is usually the condition in which the surgeon gets his cancer patient. Continuing:

"In 1905 we described the cycle alterations in the energy and growth of Jensen's tumor. Since then we have been able to confirm these observations on every one of the sixty propagable tumors growing in the laboratory. . . . In the human subject there are corresponding fluctuations in the growth of cancer. In one part of the tumor the growth is proceeding rapidly, in another part slowly. . . . Further, secondary nodules of growth are known to disappear while others are growing, and occasionally primary growths have disappeared."

A REMEDIAL STRUGGLE IN EVERY CANCER HOST.

Every case has its remedial struggle. Dr. Hodenpyle's cancer patient had in her organism sufficient power of remedial

struggle to cure her own cancer. Condition—of unknown quality, but yet condition—prevailed against cancer. Cancer usually prevails against condition. The problem of the expert is to discover the quality and defect of such condition.

CANCER CANNOT BE CAUGHT; IT MUST BE GROWN.

Is cancer infectious or contagious? Director Bashford says:

"Cancer is ubiquitous, yet there are most striking limitations to its conveyance from one individual to another. Continued growth takes place after inoculation into animals *of the same species only*. . . . Inoculation is only successful by implantation of living cells, but experiments show that this risk (that is, the risk of a surgeon acquiring it while operating) is negligible, if it exists at all in nature."

This would imply no danger to man from eating a lower animal afflicted with cancer—as for example trout, particularly cancer-ridden among fish—but would indicate that a cannibal as host might acquire the cancer of his banquet.

If cancers of lower animals have no danger to man, we yet know that sheep thyroid and hog pepsin act beneficently in the human subject. Has man only a susceptibility to their benign products? Does nature make an exception wherein only "good health is catching?"

CANCER IS NOT HEREDITARY BUT ACQUIRED OR GROWN.

The report says:

"The question of the hereditary transmission of cancer has not been settled either one way or the other for man. The short duration of the mouse's life . . . makes it the ideal animal for the study of heredity. . . . No indication of any inborn disposition playing a part in determining either a local or constitutional liability to the disease, *or even so much as an enhanced suitability for inoculation*, has been shown. . . . Therefore it would appear that the disease . . . is always acquired. . . . Other facts are even more emphatically opposed to the idea (of heredity)."

THE KIND OF DIET BEARS NO RELATION TO CANCER.

"Exceptional opportunities are afforded in India for the study of the incidence of cancer in vegetarians and flesh-eaters, since the diet is strictly ordained by the customs of the different native castes. In India the disease occurs irrespective of vegetarian or meat diet, just as it occurs in the herbivorous and carnivorous mammals."

Nutritive excess or deficiency is not contemplated in the above quotation.

THE DIFFERENTIATION IN THE CANCER CELL.

Cancer cells differ according to the kind of tissue from which they are derived. The report says:

"Cancer cells are specialized. No single species is an exact duplicate of the others. They still possess characters of less obvious kind."

Cancer cells are therefore obviously derived from many kinds of tissue.

RESUME OF AUTHORITATIVE STATEMENTS.

Mouse cancer is analogous with human cancer. Cancer is a disease of age. Cancer cannot be inoculated upon the aged. Condition is vital in cancer—extending to some complete immunity; to others a (rare) self-cure; but to the majority of the afflicted a rhythmic attempt at self-cure, with final defeat. It bears no relation to kind of diet; it is not hereditary; it is not contagious or infectious. Cancer must be grown, and its cell is differentiated according to the tissue from which it arises. From this known we pass to what, though unsettled, has sufficiently crystallized to give us practical aid.

A PROGRESSIVE IMMUNITY TO CANCER COMES WITH NORMAL AGE.

If the aged cannot be inoculated at all; if the less aged rapidly cure themselves of transplanted cancers; and if—as in the human subject—the younger the host the more virulent the cancer—then logic forces a conclusion. Some change in the organism makes cancer progressively harder to inoculate.

And yet facts also show that cancer is a disease of age. How explain?

The explanation is found in the conception of a pre-cancer stage.

The minority, non-immune, who acquire spontaneous cancer in age, do so because they have become disassociated from that force which confers the progressive immunity upon the majority. These non-immune could also be inoculated in age—with the effect of hastening the spontaneous cancer, already cited.

When and how did this disassociation begin?

PROGRESSIVE, PROPORTIONATE ALTERATION OF CELL POISE.

There is a known time when distinct changes take place in cell activities, and especially in the internal secretions which—as all know—govern blood pressure, and through blood pressure control function.

These alterations, beginning about the time of maturity—like the turn of the leaf in autumn—are normally proportionate and in adjusted relation. Flexor and extensor muscles, vasoconstrictor and vasodilator secretions, etc., increase and atrophy in like proportion and at appointed time. They are progressively immune to cancer in whom these changes so proceed.

In the abnormal non-immune few who get cancer, these processes go on irregularly, out of proper timing with respect to compensatory antagonisms. For example, a vasodilator internal secretion failing earlier than normal would leave behind a relatively more forceful vasoconstrictor antagonism—and *vice versa*—than if the rhythm and proportion had been proper.

Childhood, as a further example—with its marvelous activity of cell reproduction—is yet immune from sex-cell growth until the thymus goes. But at any time after that, until age bestows immunity, we may bring at will the “flashes” of the menopause—as by double ovariectomy. But age confers an immunity to this vasodilator disturbance which yet may be said to be a disturbance of age. The internal secretions which cause it—the younger the subject, the stronger the disturbance—have been progressively, mutually, proportionately adjusted. To the remotest individual cell there is an *adjusted cell poise*, entirely lacking at the crucial periods—as at puberty; as at maturity; when the boy’s unstable voice, the girl’s helpless blush, the matron’s vasodilator hot-flashes—paint the story in broadest relief.

Those in whom a “ferment” fails too soon, or lasts too long, have therein the basis of the pre-cancer stage. There may be special danger in the belated secretion, outlasting its normal inhibiting antagonists. These become the non-immune to cancer, and may grow it in the presence of a contributing cause.

SPECIAL IRRITATIONS AND CANCER.

Those in the first group, immune to cancer, undergo without danger the identical irritations which produce cancer in the non-immune few.

Irritations unquestionably produce cancer, but only in the presence of another cancer element. Without the cancer element they produce no cancer. Irritations are therefore only a half-cause of cancer.

THE BASAL HALF-CAUSE OF CANCER.

This lies as deep as the concept of the intra-atomic corpuscle, which, growing out of our recent study of radium, has revolutionized modern physics. For example:

"Cancer of the abdominal skin is unknown in Europe, but occurs with extraordinary frequency in Kasmir, where natives wear next to the skin an oven containing burning charcoal."

This hot oven is the half cause of this special cancer, restricted to Kasmir; but not the whole cause, for only a few who wear the oven get the cancer. What is the other cancer element?

Likewise, chewing betel-nut in Ceylon and India brings a great frequency of cancer of the inside of the mouth almost exclusively in these regions. But the majority chew with impunity; another element must obtain with the few who acquire cancer therefrom.

A hundred sewing women may each prick a finger the same number of times, but irritation brings cancer only to the non-immune few.

So with all the locomotive drivers, and all the smokers of cigarette or short-stem clay pipe; the identical irritation will bring the actinic or radiant cancer—on shin-bone or tongue, respectively—only to the few non-immune. And it is the same all through the list of irritations from which cancer may be developed.

THE CANCER ELEMENT ALONE AND NO SPECIFIC IRRITATION.

It would be important to prove that specific irritations have to be added to the basal cancer element to make cancer. For we surely could avoid the specific irritations.

It may be—let us hope not—that life's exigencies would always furnish *sufficient* wear and tear to develop the basal element of cancer. The basal half-cause may thus be really the whole cause.

WHAT IS THE BASAL CANCER ELEMENT?

If we can once agree that age is a condition and not a date—

that one can die of acute old age in childhood, as in thymic death—there need be no exceptions to the dogma that cancer is in relation to senescence.

The known interrelations between the internal secretions of the body, and the variation between their times of appearance and fading, makes this an easy conception.

For what is our youth if it be not the integrity of our glandular activities with their "ferments?" A man may be no older than his arteries, but behind the tubular works of the body are the protecting internal secretions.

We are trustees of our thymus for the brief watch of our childhood, and in a few decades we surrender our thyroid. Life is a progressive, proportionate adjustment of cell poise to changing conditions of internal secretions—as thymus and thyroid, sex glands and suprarenals, lessen and finally withdraw their special secretions. As a gland upon a platter our youth is automatically passed onward at each measurement of time, and each period prints itself beyond the effacing power of cosmetic. Puberty and the climacteric—and then the skin takes the pigment the hair ought to have.

An illness may put a man to bed young, and shortly release him irrevocably old. Of another we predicate, regardless of dates, "He has his coloring yet; his glands are working; his 'ferments' are still with him."

One has failed in adjustment; the other is advancing in proper proportions.

FUNCTIONS OF THE INDIVIDUAL CELL AND THE SPECIAL CELL FERMENT.

If the cell has not five senses, it has five functions. It must (a) assimilate and excrete to nourish itself; (b) it must reproduce itself; (c) it must perform special selective function according to its class of tissue; (d) it must help to keep the frontier of its own tissue class inviolate; (e) and it must make its general contribution to the whole organism.

Besides secreting its own bile, or tears, or adrenalin—according to kind—each must make a general vital contribution to the whole. The aggregate vitality is the sum of the units.

For this purpose each cell has a store of albumen and a special cell ferment, and in this latter lies all the distinctive quality of the cell. And the provable law governing the better known

internal secretions presumptively governs the special distinctive secretion of the individual cell.

Therefore altered cell poise, as the basal cause of cancer, probably means disproportionate change in its own ferment secretion as well as the changes in those internal secretions whose cycles are better known, and provable.

THE BORDER-LINE BETWEEN SPECIAL TISSUES.

One of the duties of a cell is to guard the frontier line of its own special tissue. The lip must not extend over the face; the uterine mucous membrane must not proliferate over the vaginal cervix. The connective tissue must not extend into the pulp; the cataract must not invade the eye; nor the hardening process creep into the artery.

The excrescence grows out over the surrounding tissue as much from failure of repelling power as from overcharge of energy in the growth. Improper timing and disproportionate atrophy of one tissue puts it at a disadvantage when facing contiguous tissue—or its antagonistic inhibiting relation.

And tissue frontiers—between pulp and connective tissue, between gland and capsule, between fiber and sheath—are the almost exclusive seats of cancer.

A DISCERNIBLE MINUS IN THE CANCER CELL.

There is only space here to cite the rôle of the chromosomes in cell life—especially cell reproduction. Likewise, only simple mention can be made of the difference in thermic and actinic color relation, respectively, as shown by stainability, presented by the cell representing sex from the female and the cell representing sex from the male. For example, the ovum cell differs from the sperm cell, not only in the quality of its color relation—one being thermal and the other chemic—but in that the male cell has exactly one less chromosome than the female cell. Search for the lost chromosome, therefore, may solve the problem of sex determination.

Now the cancer cell instead of being just one chromosome minus—as the male cell is less than the female—contains just half the number of chromosomes shown by the normal cell. Do the lost chromosomes bear any relation to the problem?

This minus is visible and accords with the logic of the cancer situation.

RELATION OF THE FERMENTS TO CANCER.

Two years ago the writer drew attention to the relation between thyroid and cancer. Director Bashford says on this subject:

"The trout is peculiarly liable under certain conditions, to a general hyperplasia of the thyroid. We have records of 2000 cases, in many of which true carcinomata have supervened, as shown on the slide."

At the same time the present writer outlined how isomeric attractions and repulsions are related to blood pressure and quality and the internal secretions. This is, presumptively, the process in the individual cell, viz.:

"Pasteur discovered the dimorphism of the double tartrate crystal. One isomer in solution is dextrorotatory in the spectro-scope; the other is levorotatory. That is, one of these varieties of the same thing turns the polarized light to the right, the other turns it to the left. As a laboratory test, to separate these two diverging forms of the same thing, they were subjected to certain fermentative tests. *The yeast plant ferment was found to act on the left isomer, while the ferment of the mold acted upon the right solution.* Please stick a pin in this fact; it has a vital bearing on what follows. The left-hand isomer, susceptible to the yeast ferment, is indifferent to the mold ferment; and the right-hand isomer, susceptible to the mold, is unacted upon by the yeast plant.

Now, if the carbon atom were symmetrical, and carbon existed only as diamond, we would freeze to death in winter. So with our food stuff. If the carbon atom should suddenly become symmetrical, existing only in its left-hand isomer while our digestive ferments attack only the right-hand isomer, or *vice versa*, we would likewise starve to death. With warehouses full of levo-albumins, levo-carbohydrates, famine would still stalk the land, because our digestive ferments could no more change them into assimilable substance than they now can the granite of the mountains.

Further, and of transcending importance to life—for without the fact there would be no life—this very powerlessness of our digestive ferments to act upon the levo-albumins of the human body is perhaps the basal reason why the human stomach does not digest its own walls."

Coalescing capacity with this, and coalescing incapacity with the other, isomer of the protoplasm atom is probably the basis of intracell action and the tissue frontier guards.

THE FERMENTS AND BLOOD PRESSURE; BLOOD PRESSURE AND FUNCTION.

More easily proved is this relation. All the functions—cerebration, salivation, digestion, etc.—start and stop with the rise and fall of blood pressure. Will-power may determine it to a certain extent, but the real regulators of blood pressure are the glands that secrete the stuff—respectively vasoconstrictor, vasodilator.

Leaving aside the hemolytic action of the great glands like the spleen—whose blood dissolving power, when in disorder, quickly blanches the organism, as in Graves' disease, leukemia, pernicious anemia, and kindred diseases which seem pre-cancer steps—let us see what is known of the relation between the internal secretions and blood pressure.

THE INTERNAL SECRETIONS.

The following is abstracted from "Internal Secretions,"* by Professor Oliver T. Osborne, of Yale:

"The pituitary body secretes vasoconstrictor stuff. . . . It seems probable that in every case of gigantism the pituitary body hypersecretes. . . . The thyroid secretes vasodilator stuff. . . . The thyroid secretion has been shown to exert profound influence on the secretion of the pancreas. . . . It should be emphasized that disturbances of the interrelations between the ductless glands, whether by disturbed secretion of one or more of them, . . . may sufficiently disturb the pancreatic secretion to cause glycosuria, and yet no apparent disease of the pancreas be found on autopsy.

"The suprarenals secrete vasoconstrictor stuff. . . . A proper amount seems necessary to the normal development and health of the red blood corpuscles. . . . A preparation of ovaries contains a vasodilator substance. . . . When both ovaries are removed . . . various symptoms occur which are evidently distinctly due to the removal of the ovarian internal secretion. . . . Cancer of the breast may cease to grow after a double ovariectomy; this before the menopause. . . . Osteomalacia has been arrested by the removal of the ovaries; hence this may be due to disturbed ovarian secretion, perhaps an oversecretion. . . . Ovarian substance has been administered in Graves' disease with some apparent success. . . .

"There is a secretion from the testicles which is necessary for the normal development and health of the male. . . . Castration before puberty causes men and animals to grow taller than

* *Jour. A. M. A.*, February 26, 1910.

normal, and to grow fat. . . . If there is thyroid insufficiency the testicles do not develop properly, and if the testicles are removed the thyroid remains small. The testicle contains vasodilator stuff.

"The parotid shows an unexplained relation to the sexual glands—there is the ever frequent occurrence of the infection of mumps causing the peculiar metastasis to the testicles and ovaries.

"The thyroid is most fully developed and active from the age of puberty to the age of forty-five. From that time its secretion is decreased until the gland atrophies in old age. Sexual excitement increases thyroid secretion, and when there is hyosecretion of the thyroid sexual desire is lost."

Note the antagonisms: Vasoconstrictor inhibits vasodilator. Hypersecretion of pituitary body grows a giant, whereas an excess of thyroid secretion checks development of the epiphyses and makes the dwarf.

The relation between the vasodilator glands is very close, and they begin fading about the same time. The vasoconstrictor stuff from adrenals and pituitary body apparently outlasts the vasodilator supply. Not to reduce humanity to a sweetbread, we may yet say that pleasure, joy, blandness, youth, are vasodilator stuff; while anxiety, fear, acidity, acerbity, and age are vasoconstrictor stuff.

THE CONSTRICTOR QUALITY OF CONNECTIVE TISSUE.

The "pulp" of cell or organ—like the pulp of an orange—is its distinctive dynamic part, whereas the connective tissue is the frame-work holding the motor in working position.

An exact harmonizing of the picture of vasoconstrictor overcoming vasodilator is shown in the hardening processes of age. The connective tissue constricts the elastic pulp tissues of the arteries, of the brain, of the heart, the liver, the kidney—just as by metaplasia true bone tissue is formed in the choroid of the eye which has lost its function. The acids bite off the enamel of the teeth, extend the womb out over the vaginal cervix, extend the erosion from the vagina, in senile vaginitis, out over the vulva.

What is this, also, but failure of contiguous territory to guard its frontier? A disproportionate, premature or late, action of one set of secretion accents the quality of its inhibiting antagonizing secretion. We may therefore discover that cancer is a question of internal secretion dosage.

THE QUESTION OF DOSAGE AND THE PRECANCER STATE.

Remembering that "the x-ray will cure some cancers and will cause some cancers," remembering that internal secretion excess or defect can grow a giant or dwarf; remembering also that electricity will stimulate a muscle and, contradictorily, under proper dosage, will likewise induce general anesthesia,—we can better realize the importance of dosage.

As fat cells and connective-tissue cells have neither the selective ferment nor function of "pulp" cells, their substitution for "pulp" cells of course reduces the production of the selected internal secretions. Just as the obese are absolutely as well as relatively deficient in blood quantity, so must the change to the non-selective cell result in absolute lessening of ferment production.

If we can increase the pulp cells by use—as we can muscle cells, for example—does this not of necessity increase the supply of special cell ferment to go therewith? And might not an extra supply of cell ferment—could we separate it and give it as we daily give the larger gland substances—act protectively against the connective tissue invasion, as thyroid substance acts against obesity?

Does the ascitic fluid used by Hodenpyle—from his self-cured patient—contain any of the extruded special cell ferment?

I ask the hematologists: Is the blood from which is deducted the vasodilator stuff of the thyroid and sex glands and the vasoconstrictor stuff of the adrenals the same as the blood from which no such deduction is being made—because of failing or failed glands? Is not the retention of these unlifted secretions in the blood as abnormal as the retention of urea in renal insufficiency?

Probably the secret of the precancer stage lies in the relation between altered cell poise and this internal secretion timing and dosage.

PRACTICAL DEDUCTIONS.—If cancer cannot be caught, cannot be inherited, but must be grown, and if its growth depends upon precancer condition plus a specific irritation, we have help for the community.

A purposeful scrutiny by one who knows the rhythm of the inevitable readjustments in cell poise may allow corrections of internal secretion timing and dosage. As glands regulate internal secretion, and as internal secretions govern blood pressure

and quality, and as these later determine function and longevity—herein is the field of pre-cancer work. Glands have been awakened from torpor; more “ferments” have remoistened the dry channels; more pulp has been regrown between the constricting frame-work tissue. A dose of aconite, even—vasodilator—has sometimes softened a pulse and poured out through the kidneys a large increase of urea, as though releasing the kidney “pulp” from constriction to action. These results are all the more striking where one set of glands falls under or outruns the ordained proportion and progression in senescence.

While the general wear and tear of life is still beyond our reach, the *specific* irritations which are the half-causes of cancer can surely be controlled. Give the sewing woman knowledge and a thimble. Lengthen the knowledge and short-stem clay pipe of the smoker. Teach the locomotive driver to shield his shins as the x-ray operator screens his ferments from the deadly ray. The betel-nut need not be chewed, and the hot oven on the abdomen may be insulated if it must be carried hot.

CUT QUICKLY OR NOT AT ALL IN CANCER.

Prompt surgery may remove chronic irritations, ulcers, irritated moles, benign tumors—all of which Crile calls “potential cancers.” But surgery should be early, and should not wait until cachexia shows. It is because of the precancer condition that local heat, electricity, local juices and late surgery will all frequently fail. Though one local spot be removed, another will grow, the basal cause remaining the same.

Thus purposeful scrutiny, effective treatment, and prompt surgery enable us to control absolutely the special irritant half-causes of cancer. The unsuspecting eighty thousand—probably a million in the world—marked for hopeless cancer in six months should know this. I hazard the belief that many could be saved if they knew it and acted upon the knowledge.

And as to the basal half-cause of cancer, this much can now be positively stated from our new knowledge of the reparative processes of the organism: Every cancer patient at the start furnishes a partial cure of his own cancer. What can we add to make it a whole cure?

It is one of the maxims of synthetical medicine that *An incurable thing may sometimes be cured by curing all the other curable things in sight.*

THE POSTOPERATIVE TREATMENT OF ABDOMINAL
SECTION FOR PELVIC DISEASE WITH ESPE-
CIAL REFERENCE TO EARLY RISING
AND THE USE OF ESERINE.*

By

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WE are all of us fettered by the bonds of tradition, and to an extent that we seldom realize, governed by precedent. In the management after operation of our cases of abdominal section for pelvic disease this has been especially emphasized in the length of time we have thought it necessary to keep our patients flat on their backs in bed. Many little incidents that we can all recall should have shown the lack of necessity for this belief. You all remember how soon Mrs. Crawford, McDowell's first ovariectomy, got out of bed.

Fourteen years ago a hospital in which I had a number of patients on whom I had within a few days performed abdominal section for serious intrapelvic conditions, caught fire and was filled with smoke. In their terror the patients got out of bed, ran down stairs from the fifth floor, were taken out of a snowy street in ambulances to other hospitals, and, strange as it may have seemed then, all recovered without the slightest ill effect. Then we have all had patients who, in the absence of the nurse, have gotten out of bed soon after operation to get a drink of water or go to the toilet, and no harm has resulted. In spite of the obvious lesson we might have learned from facts like these most of us have gone on as we were taught in the days when the technic of the abdominal incision and its closure was less perfect, when infected wounds were more common, and when there might have been better reason for the enforced rest.

I had gradually shortened the period of compulsory confinement to bed and allowed the patients to turn about as they pleased until some three years ago I was impressed by the comparatively quick and easy convalescence of a number of cases operated

* Read before the American Gynecological Society, May 3-5, 1910.

on by Dr. Boldt and allowed to get out of bed almost immediately after operation.

In order to form an opinion of my own concerning the advantages and disadvantages of this extreme method I have, for some time, systematically advocated the early getting out of bed of the patients operated on by abdominal section in my clinic at the New York Polyclinic Hospital, where the material urgently needing care is far in excess of the beds available.

It is to record the results obtained since Jan. 1, 1908, in a consecutive group of cases that this paper is written, and, therefore, it does not include sections made in other hospitals, or on private patients, though they are treated in substantially the same way and with gratifying results.

The early getting up was begun with great fear of ill happenings and was subjected to sharp criticism, but the end has shown no serious harm to any one and appreciable benefit to the majority.

These patients are all first seen, examined and treated at the dispensary, so that we have knowledge of their kidneys, hearts, lungs, and stomachs, as well as of the pelvic and abdominal conditions. Then, if operation is considered necessary and advisable, they are admitted to the hospital and prepared; the preparation consisting, usually, of a dose of castor oil rubbed up with calcined magnesia early on the morning of the day preceding the section, followed later by an enema and the preparation of the skin covering the field of operation. Severe purging is avoided as being unnecessary and weakening. There is no doubt that it often increases the tendency to bowel distention by gas, that it is a source of great discomfort to the patient, and that it increases postoperative intestinal atony, nausea, and vomiting. Only rarely are patients held in the hospital for more than twenty-four hours before operation.

The operation field is so prepared that unnecessary time is not lost in completing the cleansing while the patient is under the anesthetic. At first the usual scrub, soap poultice, and bichloride dressing was used, but during the last few months the following procedure has proved more satisfactory. The evening before operation the abdomen is shaved and scrubbed with gauze and tincture of green soap and warm water. The soapy water is carefully washed off and the skin *dried* with alcohol, painted with tincture of iodine and covered with dry sterile gauze. When the gauze is removed before operation the skin is again painted with iodine.

A moderate Trendelenburg position is used in all cases except acute appendicitis. No rough handling or sponging of peritoneal surfaces is allowed. Where it is necessary to hold back intestines, or to protect them from probable infection, broad gauze pads wrung out of warm normal salt solution are used; otherwise gauze is kept out of the peritoneal cavity.

Vessels are ligated before being divided and clamps are almost never applied except to tissues that are to be removed; the writer believing that this is an important means in avoiding thrombosis. Number two Van Horn or Sawtell plain catgut is used in the peritoneal cavity except for the suture of intestine, where silk or celluloid linen is used, or for the ligation of the appendix, where number two ten-day gut is employed and the stump is touched with pure carbolic acid. An extended experience with the purse-string suture and with simple ligation has convinced the writer that the simpler technic is equally efficient and safe.

The abdominal wound is closed in layers, with number two plain gut for peritoneum and muscle, number two ten-day chromic for fascia, and a continuous fine silk or catgut for skin. Where there seems danger of wound infection, through-and-through silkworm-gut sutures are used in median incisions in addition to the catgut layer sutures.

Where a median incision is used the abdominal dressings are held in place by a many-tailed bandage of adhesive plaster snugly applied. This bandage is an important factor in the possibility of the early rising of the patient, and its application requires some little skill. It should be applied snugly below and not so firmly above, so as to take all strain off the abdominal walls when the patient stands and yet allow room for breathing.

Before the patient is taken off the table she is given a hypodermic of eserine salicylate gr. $1/40$ and atropine sulphite gr. $1/120$. This is found to have a very positive effect in relieving postoperative pain and nausea, in promoting intestinal peristalsis, and in preventing shock. To get the best effect it should be given before the patient is taken from the operating-room. When it is used morphia is seldom needed for the control of pain. The dose of eserine is seldom repeated and should not be given more than twice at four- to six-hour intervals in doses of $1/60$ gr. In using the eserine it should be remembered that, as pointed out by Craig, it is easy to give an overdose and that an overdose may paralyze the intestinal coats by overstimulation

and do serious harm. It should also be remembered that when there is actual obstruction eserine is dangerous. When given in the doses mentioned and with the precautions noted above we have never seen any ill effects, and the testimony of the house staff and assistants is unanimous that the patients to whom it is given suffer less, have less nausea, and less abdominal distention than others. The patients usually pass from the anesthesia into a quiet and fairly comfortable condition for several hours, or from the time of operation (10 A. M.) until night, so that they do not suffer so much from the first severe pain of the operation, and, if then they are restless so that it is necessary to give a sedative to secure sleep, a dose of $1/8$ gr. of morphine is usually sufficient. When the stomach will easily retain it, sleep and freedom from pain is often best secured by giving in place of the morphia gr. 8 of aspirine with gr. 5 of verinol.

If there is vomiting, water is given freely by mouth and, when the condition will admit, the head and shoulders are raised. To relieve shock, to promote peristalsis, to control thirst, and to supply fluids, a half-pint of warm water is given by rectum every four hours for six times. An ice-bag, or sand-bag weighing 6 to 8 pounds, placed just above and over the symphysis, gives much comfort, acting as a splint and helping to keep wound surfaces closely together. The bowels often move without medication; if they do not move by the third day calomel and salts or, preferably, castor oil, is given. As a rule, no other medication or treatment is employed.

Early feeding is considered quite important. On the morning after the operation, if the patient feels like eating, she is allowed cereals, scraped meat, very soft-boiled eggs, or crusts of stale bread. And, with a clean tongue, she is rapidly worked along to a fairly full diet. No milk is allowed until patient is out of bed. Should the urine contain much indican the lactic acid bacillus is given with food both before and after operation.

For twenty-four hours the patient is usually most comfortable on her back, but is allowed to be turned on her side by the nurse if she wishes it. Sometimes on the first, usually on the second or on the third day after operation, she is lifted out of bed into a chair for a half-hour in the morning and afternoon, and after simple or clean operations is lifted out of bed from the first onto a commode to pass urine, thus avoiding any use of the catheter. The time out of bed is gradually increased, as the patient's strength increases, to an hour or more twice a day, and

the patient is encouraged to take a few steps, so that by the end of the week she is able easily and usually smilingly to walk from the ward to the surgery and report her condition.

It is found that getting the patient out of bed in this way encourages her, lessens nausea, promotes an earlier return of appetite, increases peristalsis, makes the use of the catheter seldom necessary, makes the bowel movements easier so that there is less necessity for purgatives, improves the respiration, lessens the tendency to pulmonary complications, prevents loss of muscle tone, and greatly facilitates a rapid convalescence.

The only contraindications we have found it necessary to observe are:

First.—Shock or general weakness, as expressed in a rapid or weak heart, so that we might fear syncope from the upright position.

Second.—Cases where, with a long median incision, there has been much tension in bringing together the fascial edges.

Third.—Cases that develop septic temperatures or deep wound infections.

It is to be emphasized that getting the patients out of bed in this way does not mean that they are to be out of bed all day, or are to be allowed to go to work in a week or two weeks, or that they are not to have the benefit that comes from rest and good feeding; but it does mean that the little periods out of bed greatly help toward these desirable ends. Also when patients are sent home early from the hospital they are to be kept in bed most of the day for another two weeks, or longer if any special reason exists.

With these precautions we have not seen the late neurasthenic conditions or other ill results that have been claimed to follow early rising.

In the brief report of the cases which follow great care has been taken to ascertain in every instance possible the end results of the operation and the present condition of the patient.

These patients were all seen and operated upon by myself or my first assistant at the clinic, Dr. David W. Tovey, who has charge during the summer months and to whom I am indebted for the case records of the clinic, in which he has taken especial interest.

The following table gives in a general way the nature of the operations performed, the mortality, the day on which the patient was allowed out of bed, and the day she went out of hospital.

Operation	Cases	Deaths	Day out of bed										Day out of hospital												
			1	2	3	4	5	6	7	8	9	10	10	+	5	6	7	8	9	10	11	12	13	14	10
Hysterectomy, complete.....	10	1	3	1	3	1	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	1	..	2	3
Hysterectomy, supravaginal.....	36	1	3	17	10	3	..	1	1	..	..	..	..	..	1	1	4	11	5	8	..	2	1	2	..
Salpingoophorectomy	46	2	3	15	10	7	1	3	1	1	1	1	1	1	2	4	8	8	1	2	3	6	3	3	4
For retroversion.....	34	0	4	12	7	4	1	1	2	1	..	..	..	..	..	4	6	7	2	6	2	2	1	2	2
Appendectomy, for acute conditions	8	0	2	3	1	..	..	..	1	..	..	..	..	..	1	1	1	1	1	1	..	1	..	1	1
Appendectomy, for chronic conditions.....	18	0	2	9	3	3	..	..	1	..	..	..	..	..	..	5	2	6	1	2	..	1	..	..	1
For ventral hernia.....	5	0	..	..	..	1	..	..	..	..	..	..	..	4	..	..	..	..	..	..	1	..	..	..	4
For ovarian cysts.....	10	1	..	5	..	1	1	1	1	..	..	..	..	..	..	1	1	1	1	2	..	1	..	2	..
Cesarean section.....	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Adhesions.....	1	0	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	1	..	..
Exploratory	3	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..
	172	7	15	64	32	23	4	6	7	2	1	3	8	4	15	24	34	11	23	5	15	5	14	15	15

For the sake of convenience of reference the brief abstracts of cases which follow have been taken out of their chronological order, broadly arranged in groups after the plan of the table, and then numbered consecutively.

CASES WHERE PANHYSTERECTOMY WAS DONE.

CASE I.—January 23, 1908. McK. Age forty-eight. Multipara. Carcinoma of fundus uteri. Median incision. Radical panhysterectomy. Up on fourth day; home on twenty-second.

CASE II.—March 21, 1908. M. T. Age forty-nine. Multipara. Obese. Irregular bleeding for seven months. Carcinoma of fundus uteri. Median incision. Radical panhysterectomy. Up on fourth day; home on twenty-second.

CASE III.—June 3, 1908. E. S. Age forty-five. Multipara. Carcinoma of fundus uteri. Median incision. Hysterectomy (Wertheim); no pelvic glands removed. Morphia $1/4$ grain for pain. No vomiting. Up in chair in P. M. On second day, cereal, toast, scraped beef; temperature $100\ 2/5^{\circ}$, pulse 80, bowels moved. Home on tenth day.

CASE IV.—October 4, 1908. B. K. Age forty-six. Multipara. Extensive, very soft carcinoma of body of uterus. Median incision. Wertheim hysterectomy by Dr. Jones. *Died on third day of exhaustion.*

CASE V.—April 29, 1909. K. S. Age forty-one. Multipara. Regular menstruation until November when she stopped. Flowed in March, again April 15, and has flowed since. Uterus enlarged to size of two months' pregnancy. Diagnosis, carcinoma or incomplete abortion. Curet passed into uterus, caused profuse bleeding and brought away carcinomatous tissue from fundus. Cervix packed and sewed; vagina disinfected with iodine and cut around an inch below cervix. Transverse incision. Uterus with parametrium removed through abdomen. Small drain left in vagina; peritoneum closed. Sat up on third day; home on fourteenth. January, 1910, well.

CASE VI.—March 17, 1910. R. B. Age thirty-two. Multipara. Curetted by Dr. De Gregory for supposed abortion; microscope showed carcinoma. He sent her at once to my service for operation. Transverse incision. Hysterectomy (Wertheim). Uterus contained bean-sized nodule of carcinoma in left cornu. Up on fourth day. On twelfth day perineum repaired. Home on eighteenth day. July 20, 1910, well.

CASE VII.—June 17, 1909. E. B. Age thirty. Married. Sterile. Pain and bleeding after coitus for three months. Uterus pushed forward by cystic mass size of apple on left; smaller mass on right; edge of os uteri friable and bleeds freely when touched. Carcinoma of cervix (Jeffries). Transverse incision. Ovarian cysts removed. Ureters freed and uterus with parametrium removed. One-sixth grain morphia given at 6 P. M. was followed by vomiting. Pain better controlled by ice-bag to

abdomen. Up on second day and home on seventh. Present condition: feels well and has gained 10 pounds in weight; pelvis free.

CASE VIII.—March 11, 1909. M. F. Age forty-nine. Multipara. Profuse metrorrhagia recurring after curettage. Uterus small. Transverse incision. Complete hysterectomy. Specimen showed marked endomyometritis but no carcinoma (Jef-fries). Sat up first day; home on seventh; wanted to go home before.

CASE IX.—March 16, 1909. A. B. Age fifty-one. Persistent slight vaginal bleeding for three months. General condition good. Uterus not enlarged, but bimanual examination caused free bleeding. Microscopic examination of scrapings shows glandular irregularity suspicious of malignancy. Transverse incision. Complete hysterectomy with removal of parametrium. Was given three 1/4-grain hypodermics of morphia by house surgeon without orders and became much distended. Relieved by alum enema and eserine. Up on fifth day; home on twelfth. January, 1910, well.

CASE X.—November 4, 1908. E. H. Age twenty-eight. Married. Sterile. Nodular fibroid tumor filling abdomen to 2 inches above umbilicus. Not unwell for three months. Pregnant? Transverse incision. Complete hysterectomy removing mass of fibroids with small fetus. Up on second day; home on fourteenth. December, 1909, well.

CASES WHERE SUPRAVAGINAL HYSTERECTOMY WAS DONE.

CASE XI.—January 30, 1908. R. F. Age thirty-one. Married. Sterile. History of gonorrhea. Uterus with small fibroids retroverted and adherent. Double pus tubes. Transverse incision. Supravaginal hysterectomy. Up on second day; home on eighth. Present condition: well.

CASE XII.—February 27, 1908. M. G. Age forty-eight. Multipara. Pain with increasing enlargement of abdomen for six months or more. Multiple fibroids. Median incision. Supravaginal hysterectomy. Up on second day. Cocaine operation by Dr. Bodine for cystic goitre on fifth day. Clots and blood from vagina on seventh day. Home on tenth. Present condition: well.

CASE XIII.—February 29, 1908. K. T. Age forty-three. Single. Menses always scanty. Swelling and pain in abdomen for one year. Multiple fibroids of uterus reaching to umbilicus. Median incision. Supravaginal hysterectomy. Up on second day; home on tenth. Present condition: feels well.

CASE XIV.—May 7, 1908. K. T. Age forty-eight. Multipara. Profuse vaginal hemorrhages with pain in back and lower abdomen. Median incision. Supravaginal hysterectomy for removal of fibroid size of adult head and large hydrosalpinx. Up on second day; home on fourteenth. Two months later: "feels fine."

CASE XV.—August 5, 1908. J. J. Age thirty-eight. Married. One child. Three abortions. Pain in abdomen. Rounded irregular tumor extending nearly to umbilicus. Median incision. Dense adhesions. Supravaginal hysterectomy. Up on second day; home on sixth. Present condition: "feels better than in years."

CASE XVI.—August 6, 1908. E. W. Age thirty-eight. Married. Transverse incision. Supravaginal hysterectomy for removal of fibroid uterus size of child's head. Up on second day; home on eighth. Present condition: well.

CASE XVII.—September 3, 1908. M. M. Age forty-six. Married. Sterile. Profuse menstruation. Nodular uterus size of child's head. Median incision. Supravaginal hysterectomy. Up on second day; home on tenth. Present condition: well.

CASE XVIII.—September 3, 1908. A. R. Age twenty-eight. Single. Pelvic pain and profuse menstruation. Transverse incision. Supravaginal hysterectomy for fibroid extending halfway between symphysis and umbilicus. Appendectomy. Up on first day; home on seventh. Present condition: well.

CASE XIX.—September 30, 1908. A. H. Age twenty-five. Single. Pain and bleeding. Small multiple fibroids. Supravaginal hysterectomy. Up on third day; home on eighth. Present condition: well, except for menopause symptoms.

CASE XX.—October 15, 1908. M. S. Age thirty-three. Married. Sterile. Always painful menstruation with profuse flow; now pain increasing and flow becoming excessive. Median incision. Supravaginal hysterectomy. Adenomyoma of Cullen (Jeffries). Up on second day; home on eighth. Present condition: well.

CASE XXI.—February 4, 1909. A. M. Age thirty. Married. Sterile. Menstruation every four weeks; formerly for five days, now fifteen days and profuse. One year ago, noticed lump in lower abdomen. Complains of pain in lower abdomen and pain on coitus. Examination shows a round, smooth, hard mass the size of a grape-fruit extending into the broad ligament to the left, and a similar mass the size of an orange above and to the right. Transverse incision. On opening the abdomen, the uterus was found to the right and above a fibroid mass extending into the left broad ligament; both appendages densely adherent; appendix adherent. Supravaginal hysterectomy and appendectomy. No vomiting. Slight pain. Allowed out of bed on second day; home on eighth. Present condition: March, 1910: well; has gained about 20 pounds.

CASE XXII.—May 18, 1909. S. E. Age thirty-five. Married. Pain and enlargement of abdomen. Transverse incision. Fibroid uterus size of small grape-fruit removed by supravaginal hysterectomy. Many adhesions to intestines and pelvic peritoneum, but easily freed. Up on fourth day; home on twelfth. Present condition: No pain; has gained in weight, but is mentally unbalanced, grieves for tumor and wants it put back again.

CASE XXIII.—May 20, 1909. L. D. Age twenty-three. Married. One abortion at second month, two years ago. Severe dysmenorrhea. Menorrhagia getting worse. Fibroid uterus size of orange, fixed in hollow of sacrum. Transverse incision. Dense adhesions freed; supravaginal hysterectomy; right ovary not removed. Up on third day; home on tenth. Present condition: Normal.

CASE XXIV.—July 7, 1909. B. M. Age twenty-seven. Multipara. Neurasthenic. Says she has had laparotomy twice, once for left salpingoophorectomy, once for ventral fixation. Profuse, irregular, and painful menstruation, lasting from ten to twenty days. Uterus enlarged with small fibroid nodules. Right appendages prolapsed and adherent. Tender over appendix. Transverse incision. Supravaginal hysterectomy with removal of right appendages and appendix. Adenomyoma of uterus and fibroma of ovary (Jeffries). Morphia for pain after operation. Up on second day; home on tenth. Present condition: no pain, neurasthenia improved.

CASE XXV.—October 7, 1909. A. W. Age thirty-two. Married. One child. Two abortions. Lump in abdomen for five years. Menstruation, formerly regular, is now profuse and increasing. Much pain in back and lower abdomen. Large, rounded, immovable mass filling pelvis and extending 2 inches above umbilicus. Transverse incision. Supravaginal hysterectomy for removal of fibroid uterus and pus tubes. Dense adhesions. Appendectomy. Up on second day; home on tenth. Present condition: January, 1910, well; no pain.

CASE XXVI.—January 13, 1910. C. L. Age thirty-six. Married. Two children, last twelve years old. Abortion at six weeks, sixteen months ago. Much pain in lower abdomen since. Menstruation becoming profuse. Adherent fibroid uterus size of grape-fruit. Transverse incision. Supravaginal hysterectomy. After-pain severe, $\frac{1}{4}$ grain morphia given at 4 P. M. Up on second day; home on tenth. Slight skin infection treated by Bier cup.

CASE XXVII.—February 4, 1910. E. A. Age thirty-one. Married. Three children. Neurasthenic. For four years, profuse menstruation with increasing pain. Backache; bearing down; some dyspnea; mitral systolic murmur; pulmonary second sound accentuated. Uterus nodular, filling pelvis and extending nearly to umbilicus; movable. Transverse incision. Supravaginal hysterectomy. Appendectomy. No Trendelenburg, as patient became cyanotic as soon as the table was lifted. One-sixth grain morphia for pain. Up on third day; home on ninth. General condition greatly improved, no pain.

CASE XXVIII.—February 25, 1910. I. D. Age forty-three. (See Case CXLVII.) Abdominal tumor size of pregnancy at term, with hard areas closely simulating fetus. Patient had been told by a number of gynecologists and surgeons that she was pregnant. But there was no softening of the cervix or bluing of

introitus. Amenorrhea for one year. Transverse incision. Supravaginal hysterectomy. Tumor after removal still looked like pregnant uterus, but on examination was shown to be a myoma in necrobiotic degeneration. Up on second day; home on seventh. Present condition: well.

CASE XXIX.—April 12, 1908. A. B. Age thirty. Multipara. History of ectopic ruptured at second month, four weeks before. Now has fever, pain and mass in lower abdomen. Median incision. Omentum and intestines adherent to mass in pelvis made up of clots, pus, pregnant tube ruptured at cornual end with ragged tear in cornu and side of uterus, and large left pus tube. Appendix adherent to mass. Supravaginal hysterectomy and appendectomy. Culdesac drain. Four doses of eserine. Severe vomiting. Vaginal gauze partly removed on third day. Up on third day; home on nineteenth.

CASE XXX.—October 29, 1908. A. H. Age? Single. Diagnosis: pyosalpinx. Transverse incision. Supravaginal hysterectomy for left infected ectopic pregnancy and right pyosalpinx. Up on first day; home one eighth.

CASE XXXI.—July 20, 1909. G. E. Age thirty-two. Single. Dementia precox of long standing. Maniacal at times. Gonorrhea. Nymphomania. Many abortions. Pregnant about six weeks. After consultation and with approval of relatives it was considered justifiable and proper to remove ovaries and uterus, which was done by supravaginal hysterectomy. Appendix, which was long and in culdesac, was removed. Up on third day; home on eighth. Present condition: nymphomania and mental condition same; physically well.

CASE XXXII.—November 19, 1908. S. F. Age fifty-one. Married. Abdominal fat 3 inches thick. Median incision to above umbilicus, cutting out umbilical hernia. Cyst size of football and intraligamentous. Capsule split at round ligament and tumor enucleated with difficulty. Supravaginal hysterectomy. Papilloadenoma (Jeffries). Up on second day. On fourth day, while up, felt sharp pain in abdomen and fainted. Slight skin infection at pubic end of wound. Home on fifteenth day.

CASE XXXIII.—April 9, 1908. M. C. Age twenty-nine. Married. Sterile. Dyspareunia. Uterus retroverted and adherent. Masses on either side. Median incision. Pelvic structures studded with tubercle. Supravaginal hysterectomy and appendectomy. Up on third day; home on ninth. Some bladder irritation. Year later reports herself well.

CASE XXXIV.—January 27, 1908. J. F. Age twenty-four. Married. Sterile. Thin and weak, backache and pelvic pain. Abdomen enlarged by rounded, fixed, fluctuant tumor extending nearly to ensiform. Median incision. Dense adhesions. Multilocular ovarian cysts, pus tubes, and uterus removed by supravaginal hysterectomy. Extensive raw surfaces in pelvis could not be covered by peritoneum, so pelvic cavity was packed with

iodoform gauze, with end in vagina through culdesac incision. Morphia required for pain. Up on sixth day. Drain all removed on seventh. Home on thirteenth.

CASE XXXV.—March 18, 1908. J. B. Age twenty. Single. History of old pelvic inflammation. Severe pelvic pain for four days. Temperature 101° , pulse 110° . Median incision. Many adhesions. Large pus tubes and uterus removed by supravaginal hysterectomy. Appendectomy. Up on third day; home on fourteenth. Present condition: well.

CASE XXXVI.—June 18, 1908. L. P. Age twenty-three. Married. Sterile. Gonorrhea. One year ago at Bellevue vaginal section for acute pyosalpinx. Pain; backache; nausea. Transverse incision. Supravaginal hysterectomy and appendectomy. Up on third day; home on eighth. January, 1910: "feeling fine."

CASE XXXVII.—July 11, 1908. A. S. Age twenty-nine. Married. Sterile. Gonorrhea, ten years ago. Median incision. Supravaginal hysterectomy and appendectomy. Up on second day; home on ninth.

CASE XXXVIII.—July 23, 1908. L. R. Age twenty-five. Married. Sterile. Gonorrhea. For four years sacral backache; bearing down; headache; nausea. Pyosalpinx. Transverse incision. Supravaginal hysterectomy. Up on second day; home on tenth. Present condition: "In best of health."

CASE XXXIX.—August 13, 1908. F. L. Age twenty-six. Married. Sterile. Gonorrheal pyosalpinx. Transverse incision. Supravaginal hysterectomy. Appendectomy. Up on second day; home on eighth. Slight skin infection which healed readily with use of Bier cup. Present condition, Jan. 1910: feel perfectly well.

CASE XL.—September 1, 1908. M. R. Age twenty-six. Married. Sterile. Operated three years ago for appendicitis; never well since. Uterus retroverted and adherent. Transverse incision. Supravaginal hysterectomy for pus tubes with dense adhesions. Adhesions about cecum freed. Up on first day; home on fifth. Present condition: well.

CASE XLI.—June 17, 1909. C. S. Age twenty-two. Single. Gonorrhea. One abortion eight months ago at three months. Transverse incision. Double ovarian abscess and pyosalpinx. Supravaginal hysterectomy. Pus sacs ruptured during enucleation. No drainage. Hiccough for one hour after operation. Up on third day; home on seventh. Present condition: normal except for menopause symptoms.

CASE XLII.—November 25, 1909. T. A. Age twenty-two. Married. One child one year ago. Gonorrhea. Pelvic pain and aching for one year. Anemic and thin. Retroversion and pyosalpinx. Transverse incision. Supravaginal hysterectomy and appendectomy. Part of one ovary left. One-eighth grain morphia for pain. Up on fourth day; home on eighth. Present condition: well.

CASE XLIII.—December 2, 1909. A. P. Age twenty-four. Married. Sterile. Gonorrhea. Severe backache and pelvic pain. Left intraligamentous ovarian cyst. Right small dermoid. Salpingitis. Retroversion. Transverse incision. Supravaginal hysterectomy and appendectomy. Up on fourth day; home on eighth. Present condition: greatly improved; no pain.

CASE XLIV.—January 27, 1910. M. F. Age thirty-four. Married. One child eighteen years ago. Old gonorrheal infection. For two years loss of weight and strength. Backache. Pelvic pain. Constipation. Uterus firmly adherent in sacral hollow with large masses on either side. Transverse incision. Supravaginal hysterectomy for large double pyosalpinx and left ovarian cyst. Appendectomy. Up on second day and walked to toilet; home on seventh day. Present condition: no pain; greatly improved. Feels better than in years.

CASE XLV.—March 3, 1910. C. F. Age forty-seven. Multipara. Flushes. Pelvic pain and sacral backache; bearing down. Thin and weak. Uterus fixed; large tender masses on both sides. Pain on defecation. Lacerated perineum. Transverse incision. Supravaginal hysterectomy for large pus tubes with adherent sigmoid. Perineorrhaphy. Severe pain; 1/6 grain morphia at 6 P. M. Second day, temperature 101. Weak. Up on third day; home on twelfth. Present condition, May 10, 1910: well.

CASE XLVI.—April 28, 1910. D. S. Age thirty-six. Multipara. One induced abortion followed by sepsis. Anemic and weak. Severe pelvic pain. Large pus tubes. Transverse incision. Supravaginal hysterectomy by Dr. Tovey. Developed acute streptococcus peritonitis and *died on sixth day*.

CASES WHERE SALPINGECTOMY WAS DONE ON ONE OR BOTH SIDES.

CASE XLVII.—March 5, 1908. N. F. Age twenty-eight. Married. Spotted for six weeks. Severe pain at times. Lower abdomen distended by rounded, fluctuant mass diagnosed as cyst with twisted pedicle (ruptured ectopic). Median incision. Dirty blackish cyst, size of child's head, adherent to intestine and pelvis; ruptured, full of black clots, enucleated with difficulty. Right pregnant tube removed. Troublesome venous bleeding deep in pelvis controlled by gauze pack and vaginal drain. Convalescence stormy. Up on fourth; home on fifteenth day. Present condition, May 10, 1909: feels fine.

CASE XLVIII.—April 13, 1908. I. N. Age thirty-three. Married. One child. Menstruation, Feb. 7, one week overdue. Spotting since. Pains on right side and down thigh. Ruptured ectopic. Median incision. Clots and pregnant tube removed. Up on second day; home on seventh. Present condition: normal. Child born Feb., 1910.

CASE XLIX.—April 23, 1908. W. S. Age twenty-four. Married. Nursing child. Pain and bloody discharge for two weeks. No fever until day before operation. Hard, tender mass on right pushing uterus to left. Ruptured ectopic. Median

incision. Free blood and clots in abdomen. Pregnant tube and appendix adherent to mass removed. Up on third day; home on eighth. Present condition: well.

CASE L.—May 7, 1908. E. B. Age twenty-eight. Married. Sterile. Three months ago flow week overdue, spotting since. Pain on left side, running down inside thigh. Ectopic? Examination under ether: Uterus retroverted; hard mass which seemed part of uterus on anterior surface. Curet showed uterus empty. Median incision. Pregnant left tube on anterior surface firmly adherent to omentum and sigmoid. Impossible to separate sigmoid from sac so piece was cut away and left. Up on fourth day, as her own physician objected to her getting up sooner. Home on twelfth. Present condition: normal.

CASE LI.—January 14, 1909. J. S. Age twenty-four. Married two years. Never pregnant. Menstruation regular, except that last period was nine days overdue. She then thought she was pregnant and had a sound passed to bring on an abortion. This started a flow and she has been spotting and passing clots since. For ten days she has had severe pain in left side running down inside of thigh. Firm, tender mass size of fist on left of the uterus. Tubal abortion? Transverse incision. No free blood in peritoneal cavity. Right appendages normal. Omentum adherent over left side of pelvis. Adhesions when freed showed tube pregnant in its outer half and handful of clots. Tube and free clots removed. No pain, vomiting or distention. On the third day the temperature rose to 101.5, but dropped to normal after moving bowels. Sat up on second day; insisted on going home on seventh day. Present condition: normal.

CASE LII.—June 26, 1909. M. W. Age twenty-six. Married. One child. Gonorrhea. Menstrual history uncertain. One week ago began to complain of severe pain in the right side and slight bleeding from the vagina. Fainted several times during day and was admitted to the hospital in marked shock. Ruptured ectopic. Transverse incision. Abdomen distended with fluid blood; right tube ruptured at isthmus; tube and ovary removed; clots scooped out; no attempt made to remove fluid blood; abdomen closed. Unruptured ovum, size of plum, found in clots. Patient very anemic and in severe shock. Hot continuous rectal irrigation. Foot of bed elevated. Oxygen given for several hours.

On admission temperature was 102, pulse 150, and temperature afterward reached 103.5 though peritoneal symptoms were but slight. This was explained when on the fourth day pain over the gall-bladder and jaundice appeared. Sat up on the eighth day and went home on the thirteenth.

CASE LIII.—March 3, 1908. W. D. Age thirty-two. Married. One child. One abortion, sepsis after. Specific history. Pelvic pain, backache, and bearing down. Obese. Retroversion with descent, chronic salpingitis. Median incision. Appendages removed, but right ovary, apparently normal, left. Ventral

fixation. High amputation of cervix. Up on fourth day; home on twelfth. After three months, profuse hemorrhages from uterus, relieved by mixed treatment. Ovary developed cyst size of grape-fruit, uterus became heavy. Finally removed uterus and cyst per vaginam. Patient now well.

CASE LIV.—March 9, 1908. J. T. Age twenty-four. Married. Sterile. Gonorrhea. Purulent salpingoophoritis. Median incision. Appendages and appendix removed. Ventral suspension. Up on third day; home on twelfth. July 22, 1908: uterus in good position.

CASE LV.—April 2, 1908. A. B. Age twenty-one. Single. Gonorrhea. Retroversion. Pyosalpinx. Median incision. Left tube, size of banana, removed leaving ovary. Right tube, ovary, and appendix removed. Ventral suspension. Up on first day; home on eighth. Second day cereal, eggs, milk, toast. Three months after operation reported, feeling fine.

CASE LVI.—April 9, 1908. A. M. Age thirty-three. Married. Fat, pale, alcoholic. Old pelvic infection with recent acute attack. Pelvis filled with inflammatory mass. Median incision. Large tuboovarian abscesses enucleated with difficulty. Extensive raw, bleeding surfaces in pelvis. Culdesac drain. After twenty-four hours acute dilatation of stomach. Collapsed. Pulse 130 to 140. Temperature 99°. Stomach tube removed quart or more of coffee-colored fluid. Improved until night (thirty-six hours). Then extreme distention and collapse as before. Stomach washed, much coffee-colored fluid removed. Thirst intense; patient got out of bed for water. Morphia gr. $\frac{1}{4}$, rallied. Infection of skin at lower angle of wound where it had become uncovered. Healed quickly under Bier cup. Up on twelfth day; home on twenty-first. January, 1909: wound firm, feels fine, except for rheumatism.

CASE LVII.—April 14, 1908. C. H. Age twenty-six. Married. Sterile. Dyspareunia. Pyosalpingitis. Median incision. Salpingoophorectomy and appendectomy. Up on fifth day; home on eighth. Present condition: No pain, but has locomotor ataxia.

CASE LVIII.—April 16, 1908. Age? Married. Sterile. Pain on left side. Left ovary enlarged and prolapsed. Uterus fixed. Median incision. Appendectomy. Left salpingectomy. Up on third day; home on eighth.

CASE LIX.—April 18, 1908. M. S. Age twenty-four. Married. One child. Three abortions. Gonorrhea one year ago. Severe dysmenorrhea and backache. Retroversion. Pyosalpinx. Median incision. Appendages except left ovary removed. Appendectomy. Ventral suspension. Up on third day; home on twelfth. Three months later reports: feeling well.

CASE LX.—May 28, 1908. B. P. Age twenty-two. Married. Pyosalpinx. Median incision. Pus tubes and left ovary removed. Up on third day; home on ninth. June, 1909, reports: feels well, no pain.

CASE LXI.—June 10, 1908. J. F. Age twenty-six. Married. Sterile. Pain, backache, and dyspareunia. Transverse incision. Appendages removed. Up on fourth day; home on nineteenth.

CASE LXII.—August 5, 1908. E. W. Age twenty-five. Single. One abortion at three months seven years ago, pain since. Median incision. Salpingectomy and appendectomy. Sat up on first day. Second day temperature 104° , pulse 140, respiration 42, signs of congestion at base of right lung; aspirin gr. 5, q. 2 h. Third day, temperature 99° , pulse 100, respiration 24. No further complications. Home on eighth day at own request.

CASE LXIII.—August 13, 1908. B. F. Age twenty-three. Prostitute. Pelvic pain and backache. Dyspareunia. Chronic salpingitis. Transverse incision. Appendages except left ovary removed. Adherent appendix removed. Up on fourth day; home on twelfth. Present condition: no pelvic pain. Gonorrhea.

CASE LXIV.—September 10, 1908. C. M. Age twenty-eight. Prostitute. Old pyosalpinx with recent acute process. Transverse incision (Dr. Tovey). Operation difficult with large raw surfaces left in pelvis. Vaginal drainage. Took ether badly. *Died on tenth day.*

CASE LXV.—November 1, 1908. M. C. Age twenty-two. Single. Chronic pyosalpinx. Retroversion. Transverse incision. Appendages removed except part of right ovary. Appendectomy. Ventral suspension. Up on fourth day; home on seventh. Present condition: well.

CASE LXVI.—December 10, 1908. J. C. Age twenty-five. Married. Two children. One abortion at six weeks; sepsis; pain since. Pyosalpinx. Transverse incision. Appendages and appendix removed. Up on second day; home on fourteenth. Reported well, June, 1909.

CASE LXVII.—February 11, 1909. H. D. Age forty-five. Widow. Two abortions. Three years ago had appendix removed during acute attack and operation was followed by severe pelvic infection. Severe sacral backache and aching, stabbing pain with tenderness in right side since, but worse for last three months. Uterus small and fixed by adhesions. Transverse incision. Web-like adhesions about both appendages and about cecum freed. Tubes and ovaries removed, as both ovaries showed marked cystic degeneration. Ventral fixation. Up on first day; home on fourteenth. Reports: completely relieved of all pain.

CASE LXVIII.—March 4, 1909. A. C. Age twenty-nine. Married. Two children. Menstruation profuse and painful. Backache and pain over lower abdomen for two and a half years since birth of last child. Heavy fixed uterus with mass on either side. Transverse incision. Large densely adherent pus tubes and ovaries removed. Left pus sac so densely ad-

herent to intestine that a portion one inch square was of necessity left adherent to gut. Appendix involved in adhesions and removed. Ventral suspension. Walked to toilet on second day; home on seventh. Present condition: feels better than in years.

CASE LXIX.—March 25, 1909. M. E. Age twenty. Prostitute. Premature labor at seven months six weeks ago. Fever, pelvic pain, and bloody vaginal discharge since. Under observation in bed in hospital for one week. Large pyosalpinx high in abdomen; nothing in culdesac. Transverse incision. Pus tubes and ovaries, matted together, entirely above pelvic brim, and adherent to intestines, removed. Morphia for pain. Up on second day. On sixth day when skin stitches were removed, wound opened discharging clots and fluid blood. Treated by Bier cup, healed after slight suppuration. This bleeding in the wound is not to be attributed to the early mobility but to imperfect hemostasis at the time of operation. Home on seventeenth day. Condition, March, 1910: wound firm, no pain; feel well.

CASE LXX.—March 26, 1909. A. B. Age eighteen. Prostitute. Gonorrhea. Dyspareunia, Dysmenorrhea. Constipation. Uterus retroverted and fixed by masses on either side. Transverse incision (Dr. Wells). Dense adhesions to tubes, ovaries, uterus, appendix, and omentum. Tubes, ovaries, and appendix removed. *Died on third day* of streptococcus peritonitis.

CASE LXXI.—July 22, 1909. B. I. Age twenty-four. Married. One child five years old; sepsis after. Uterus retroverted and adherent. Lacerated perineum. Transverse incision. Curettage. Perineum repaired. Tubes and left ovary removed. Ventral suspension. Up on sixth day; home on tenth. February, 1910, reports: best health in years.

CASE LXXII.—August 5, 1909. A. G. Age twenty-four. Married. Sterile. Gonorrheal pus tubes. Syphilis. Transverse incision. Both tubes distended with pus and removed. Appendectomy. Up on second day; home on fifth. Present condition: no pain; general condition much better; osteitis of leg.

CASE LXXIII.—August 5, 1909. A. M. Age twenty-seven. Married. One child. Two abortions, last four years ago. Pain since over lower abdomen, worse during menstruation. No backache. Appendages thickened and tender. Transverse incision. Right cystic ovary, size of apple, with adherent tube filled with fluid and size of finger, removed. Left tube in similar condition removed. Club-shaped appendix removed. Up on third day; home on seventh. Present condition: well.

CASE LXXIV.—September 2, 1909. J. B. Age twenty-seven. Married. One child four years ago. Constant pain over lower abdomen with backache and nausea since birth of child. Tender over appendix. Uterus fixed. Transverse incision. Appendix in mass of adhesions removed. Salpingectomy.

Perineorrhaphy. Up on third day; home on eighth. Present condition: no pain, perineum strong.

CASE LXXV.—December 16, 1909. G. M. Age thirty. Married. Two children. Abortion six weeks ago. Pain in the right side, extending down thigh. Rigidity and tenderness over appendix. Uterus fixed. Transverse incision. Appendages and appendix removed. Up on the third day; home on the seventh. Present condition: normal.

CASE LXXVI.—December 30, 1909. H. L. Age thirty-six. Married. One child. Premature labor at seven months, four months ago. Since has pain over lower abdomen and sacral backache. Uterus fixed by masses on either side. Transverse incision. Double salpingoophorectomy and appendectomy. One-fourth grain morphia for pain. Slight infection of skin. Up on second day; home on seventh. Present condition: feeling fine.

CASE LXXVII.—January 17, 1910. A. G. Age twenty. Married. One child fifteen months ago. Pain in lower abdomen for five months, worse at night. Gonorrhea. Uterus fixed. Transverse incision. Pus tubes and appendix removed; ovaries saved. Up on second day; home on sixth. Present condition: feels well.

CASE LXXVIII.—January 20, 1910. M. K. Age thirty-two. Married. One child. Three abortions (not induced). Adherent retroversion. Chronic salpingitis. Complete laceration of perineum. Transverse incision. Salpingoophorectomy. Appendectomy. Ventral fixation. Perineorrhaphy. Up on third day; home on eleventh. Present condition: no pain; sphincter control good and perineum strong. Health perfect.

CASE LXXIX.—January 27, 1910. F. V. Age twenty-nine. Married. Four children. Sacral backache and pelvic pain. Large indefinite masses on both sides of uterus. Recent tenderness over appendix. Temperature 101, pulse 110. Transverse incision. Intestines adherent to uterus and bladder with many cystic pockets full of clear serous fluid. Double pus tubes removed. Appendix, acutely inflamed, removed. Large ragged area in culdesac packed with gauze draining into vagina. Morphia first night for pain. Up on second day; home on eighth.

CASE LXXX.—March 10, 1910. E. S. Age twenty-seven. Married. Two children, last five years ago. Dyspareunia since. Uterus retroverted and adherent. Rectocele. Transverse incision. Salpingoophorectomy and appendectomy. Ventral suspension. Perineorrhaphy. Curettage. Up on second day; home on eighth. Present condition: no pain; pelvic floor strong (June, 1910). Recent gonorrhea from husband.

CASE LXXXI.—March 17, 1910. E. T. Age twenty-eight. Married. Sterile. Chronic salpingitis. Transverse incision. Double salpingectomy. Right ovary saved. Appendectomy. Two P. M.: Wound found bleeding. Dr. Tovey cut skin sutures, wiped out clots, found fascia stitches broken, recti separated by

clot. Resutured, put in gutta-percha drain, and closed wound. Morphia to quiet patient. Drain removed next day. Up on fourth day; home on eleventh. Present condition: well.

CASE LXXXII.—March 24, 1910. M. K. Age thirty-eight. Married. Five children, last five years ago. Five induced abortions, last two years ago. Large pus tubes filling pelvis. Transverse incision. Patient very fat; took ether badly. Appendages and appendix removed. Ventral suspension. Morphia to control pain. Up on second day; home on sixth. Present condition: well.

CASE LXXXIII.—March 6, 1908. J. H. Age thirty-eight. Married. Sterile. Chronic salpingoophoritis. Adherent retroversion. Median incision. Left salpingoophorectomy and appendectomy. Up on second day; home on tenth.

CASE LXXXIV.—August 13, 1908. B. F. Age twenty-three. Married. Sterile. Dilatation and curettage three years ago for painful menstruation. Pain in lower abdomen since with recurrent attacks of pain and fever. Transverse incision. Right salpingoophorectomy, left tube resected, appendectomy. Postoperative fever with pain in region of appendix. Up on tenth day; home on thirteenth.

CASE LXXXV.—August 20, 1908. I. K. Age twenty-six. Married. Several attacks of appendicitis. Transverse incision. Appendectomy. Left salpingoophorectomy for ovarian cyst size of apple; dense adhesions. Up on second day; home on seventh. Present condition: well; curetted for an abortion, December, 1909.

CASE LXXXVI.—August 20, 1908. C. G. Age seventeen. Single. Gonorrhea. Pain over lower abdomen; mass to right of uterus. Transverse incision. Right salpingoophorectomy. Appendectomy. Up on first day; home on sixth. October, 1909, well.

CASE LXXXVII.—September 3, 1908. E. B. Age thirty-eight. Married. One child. Eight years ago operation by Dr. Wells for acute appendicitis. Uterus retroverted and adherent. Transverse incision. No adhesions about cecum. Left salpingoophorectomy for removal of ovarian cyst with dense adhesions. Ventral suspension. Up on sixth day; home on eleventh. June, 1909, well.

CASE LXXXVIII.—December 3, 1908. F. M. Age twenty-five. Married. Sterile. Dyspareunia. Chronic salpingitis. Transverse incision. Left ovary and tube freed and held up by Barrows operation. Right appendages removed. Curettage. Up on second day; home on fifth. Present condition: well.

CASE LXXXIX.—January 20, 1909. E. S. Age thirty-four. Multipara. Backache, pain over lower abdomen, and bearing down and weakness when on her feet. Uterus retroverted and adherent, with mass to left. Perineum torn to sphincter. Curettage. Perineorrhaphy. Transverse incision. Uterus freed and brought forward; left appendages removed; ligature placed

outside of large mass of dilated veins with phleboliths found in left broad ligament; ventral fixation. Up on ninth day; home on twelfth.

CASE XC.—March 22, 1909. C. H. Age thirty-one. Married. Sterile. Chronic salpingitis. Transverse incision. Adherent cystic ovary and tube containing pus removed from the right side. Adherent appendix removed. Up on seventh day; home on sixteenth.

CASE XCI.—August 19, 1909. A. C. Age twenty-five. Married. One child five months old. Backache since. Now pain and tenderness over appendix and right ovary. Uterus drawn to right with great tenderness in right fornix. Rectocele. Perineum torn to sphincter. Transverse incision. Appendix, right tube, and ovary, red, swollen, and covered with a thick layer of recent lymph, removed. Up on second day. Perineum repaired on seventh day. Home on thirteenth day. March, 1910, well.

CASE XCII.—April 28, 1910. M. P. Age twenty-one. Married. Sterile. Salpingitis. Retroversion. Transverse incision. Adhesions freed. Left appendages removed. Appendectomy. Ventral suspension. Up on third day; home on sixth. Present condition: well.

CASES OPERATED FOR RETROVERSION.

CASE XCIII.—February 13, 1908. C. R. Age twenty-three. Single. Gonorrhea. Pain in back and right ovary. Uterus retroverted; both ovaries prolapsed. Median incision. Slight adhesions. Barrow's operation. Ventral suspension. Up on second day; home on eleventh. May, 1909, uterus in good position. Well.

CASE XCIV.—February 24, 1908. F. K. Age twenty-two. Married. One child. Induced abortion five months ago. Pregnant six weeks. Uterus could not be replaced under ether. Median incision. Posterior adhesions broken; round ligaments shortened. Aborted four days later. Up on seventh day; home on tenth.

* CASE XCV.—March 10, 1908. M. S. Age thirty. Virgin. Persistent backache and pain and tenderness over appendix. Retroversion. Chronic appendicitis. Median incision. Uterus quite firmly adherent. Kelley suspension. Appendectomy. Up on fifth day; home on twentieth. Slight skin infection.

CASE XCVI.—May 21, 1908. S. T. Age twenty-eight. Married. Sterile. Wants child. Heavy retroverted uterus with adhesions. Median incision. Filmy adhesions about appendages broken up and round ligaments shortened. Up on fourth day; home on eighth.

CASE XCVII.—May 29, 1908. M. F. Age twenty-nine. Married. Repeated abortions. Uterus retroverted and adherent. Transverse incision. Adhesions freed and round ligaments shortened. Up on first day; home on seventh. February, 1910, well.

CASE XCVIII.—June 9, 1908. I. B. Age thirty-one. Married. One child. Backache and bearing down. Uterus retroverted and adherent. Transverse incision. Round ligaments shortened. Appendectomy. Up on second day; home on twelfth. April, 1910, "perfectly well."

CASE XCIX.—July 26, 1908. M. L. Age twenty-six. Single. Backache and bearing down. Nervous. Median incision. Gilliam operation. Up on fourth day; home on eighth. March 18, 1910, well nourished; pelvic organs normal; neurasthenic.

CASE C.—July 16, 1908. T. S. Age twenty-four. Married. One child. Retroversion, Lacerated cervix. Curettage. Amputation of cervix. Transverse incision. Round ligaments shortened. Appendectomy. Slight postoperative pneumonia. Up on eighth day; home on eleventh. Well one year ago.

CASE CI.—July 21, 1908. S. R. Age twenty-eight. Married. Sterile. Uterus retroverted and fixed. Transverse incision. Appendectomy. Ventral suspension. Right ovary suspended by Barrow's operation. Up on first day; home on tenth. January, 1909, uterus retroverted as before operation.

CASE CII.—August 5, 1908. E. V. Age thirty-five. Sterile. Backache and bearing down. Retroversion. Transverse incision. Round ligaments shortened. Cystic ovary resected. Appendectomy. Up on first day; home on seventh. Present condition: no pain, uterus in good position.

CASE CIII.—September 3, 1908. M. B. Age twenty-nine. Married. Two children. Dysmenorrhea. Backache. Retroversion with adhesions. Transverse incision. Adhesions freed. Ventral suspension. Appendix, thickened and adherent, removed. Up on second day; home on seventh. Present condition: well.

CASE CIV.—September 10, 1908. A. D. Age thirty-eight. Married. Retroversion. Right ovarian cyst size of orange. Transverse incision. Cyst removed. Ventral suspension. Appendectomy. Up on second day; home on seventh. Present condition: seven months pregnant; feels well.

CASE CV.—October 24, 1908. M. S. Age thirty-three. Single. Retroversion. Transverse incision. Round ligaments shortened. Appendectomy. Up on third day; home on eighth.

CASE CVI.—October 29, 1908. K. G. Age thirty-three. Multipara. Retroversion. Lacerated perineum. Perineorrhaphy. Median incision. Gilliam. Appendectomy. Morphia, gr. 1/4. Up on eleventh day; home on seventeenth.

CASE CVII.—October 29, 1908. M. M. Age forty. Single. Retroversion. Rectocele with intact hymen. Median incision. Ventral fixation. Perineorrhaphy. Up on tenth day; home on thirteenth. January, 1910: well.

CASE CVIII.—November 26, 1908. A. D. Age thirty-eight. Multipara. Perineum repaired shortly before. Transverse incision. Gilliam. Up on second day; home on seventh.

CASE CIX.—April 27, 1909. M. H. Age thirty-six. Mar-

ried. Sterile. Backache; dyspareunia at times; tender over appendix; nervous. Retroversion. Transverse incision. Appendectomy. Round ligaments shortened by Baldy's method. Up on second day; home on ninth. Present condition: well, except for pain in right ovary at times.

CASE CX.—June 10, 1909. H. L. Age twenty-nine. Married. One child. Induced abortion two years ago, severe backache since. Uterus retroverted and adherent; tender mass on either side; perineum lacerated; some rectocele. Transverse incision. Adhesions freed about uterus and prolapsed ovaries; tubes normal. Round ligaments shortened by Baldy's method. Appendix removed. Perineorrhaphy. Up on sixth day; home on tenth. Present condition: normal.

CASE CXI.—June 17, 1909. A. S. Age twenty-nine. Married. Sterile. Retroversion. Transverse incision. Baldy's operation. Appendectomy. Up on fourth day; home on eighth. Present condition: normal.

CASE CXII.—June 24, 1909. J. D. Age twenty-two. Single. Pain on right side of abdomen for three months, getting worse, and now extending down thigh. Tender over appendix. Retroversion. Transverse incision. Appendectomy. Right ovary, firmly adherent to pelvic floor, freed. Baldy's operation. Up on first day; home on sixth. Present condition: normal.

CASE CXIII.—July 27, 1909. A. W. Age twenty-seven. Married. One induced abortion at three months two years ago. Says that one year ago left tube was taken out and round ligaments shortened. Constant pain made worse by defecation. Uterus retroverted and adherent with tender mass to left. Transverse incision. Heavy retroverted uterus freed and brought forward. Sigmoid, firmly adherent to site of left tube and top of broad ligament, was separated with difficulty. Right ovary freed from adhesions. Appendectomy. Round ligaments shortened by Baldy's method. Up on second day; home on sixth. Present condition: good, no pain.

CASE CXIV.—July 31, 1909. M. C. Age twenty-six. Single. Backache. Tender over appendix. Retroversion. Transverse incision. Adherent, thickened appendix removed. A bean-shaped stone found loose in abdomen near appendix. Round ligaments shortened by Baldy's operation. Up on third day; home on twelfth. Present condition: pain relieved; feels well.

CASE CXV.—August 5, 1909. N. H. Age twenty-three. Married. Sterile. Adherent retroversion. Backache and bearing down. Transverse incision. Round ligaments shortened by Baldy's operation. Up on second day; home on eighth. Present condition: well.

CASE CXVI.—August 12, 1909. L. K. Age thirty-one. Married. Pain in back and bearing down since birth of first child. Retroversion. Relaxed pelvic floor. Transverse incision. Round ligaments shortened by Baldy's operation. Ap-

pendectomy. Perineorrhaphy. Up on second day; home on eighth. Present condition: uterus in good position, perineum firm, no pain.

CASE CXVII.—August 26, 1909. E. U. Age thirty-two. Multipara. Pelvic aching when on her feet. Pain and tenderness over appendix. Retroversion and chronic salpingitis. Transverse incision. Tube and right ovary removed. Mass of dilated veins in left mesosalpinx ligated and removed. Appendectomy. Infundibulo-pelvic ligaments sewed to cornua held uterus in good position. Cervix and perineum repaired. Up on third day; home on tenth.

CASE CXVIII.—September 9, 1909. M. M. Age thirty-three. Married. Retroversion. Pelvic floor relaxed. Transverse incision. Baldy's operation. Appendectomy. Up on second day. Perineum repaired on seventh day. Home on fourteenth. Present condition: "feels better than in years."

CASE CXIX.—September 16, 1909. A. A. Age thirty-nine. Married. One child. One abortion. Complains greatly of pain over lower abdomen and bearing down when on her feet. Operation eight years ago at one hospital for rectal prolapse and eight months ago at another for appendicitis, movable kidney and right inguinal hernia. Uterus retroverted, pelvic floor relaxed, deep laceration of cervix. Transverse incision. Baldy's operation. Cervix amputated. Perineorrhaphy. Up on second day; back to bed because of bleeding from cervix. Up again on seventh day; home on fourteenth. April, 1910, has "gained in weight and feels fine."

CASE CXX.—October 7, 1909. R. S. Age thirty-six. Multipara. Constant sacral backache and bearing down for three years. Transverse incision. Gilliam operation. Perineorrhaphy. Up on third day; home on eighth.

CASE CXXI.—October 14, 1909. M. B. Age thirty-eight. Multipara. Constant pain and backache with bearing down when on her feet. Neurasthenic. Transverse incision. Gilliam operation. Perineorrhaphy. Appendix with concretion removed. Up on third day; home on tenth. Present condition: no pain in back or bearing down, but neurasthenic.

CASE CXXII.—December 16, 1909. L. S. Age thirty-two. Multipara. Dysmenorrhea. Backache. Bearing down. Miserable. Losing weight. Transverse incision. Baldy's operation. Perineorrhaphy. Up on second day; home on seventh. Present condition: no pelvic symptoms, but has tuberculosis.

CASE CXXIII.—January 17, 1910. M. F. Age thirty-eight. Multipara. Retroversion with adhesions. Lacerated perineum and rectocele. Transverse incision. Ventral suspension. Perineorrhaphy. Up on third day; home on tenth. Present condition: normal.

CASE CXXIV.—January 27, 1910. R. B. Age twenty-five. Multipara. Backache for five years. Retroversion. Trans-

verse incision. Baldy's operation. Up on second day; home on sixth. Present condition: normal; no pain.

CASE CXXV.—March 26, 1910. S. M. Age twenty-seven. Married. One child, nine years old. Backache. No menstruation for three years, but severe pain in lower abdomen each month. Transverse incision. Ovaries atrophic. Baldy's operation. Appendectomy. Perineorrhaphy. Up on fourth day; home on ninth. Present condition: normal.

CASE CXXVI.—April 28, 1910. F. H. Age twenty-one. Married. One child. One abortion. Retroversion. Transverse incision. Baldy's operation. Appendectomy. Up on third day; home on sixth. Present condition: well.

OPERATIONS FOR ACUTE APPENDICITIS.

CASE CXXVII.—January 13, 1908. A. M. Age twelve. This, third, attack started twenty-four hours before with vomiting, pain, fever, and prostration. Abdomen rigid; face pinched; pulse 130, weak; temperature 103° . Right rectus incision. Gangrenous, ruptured appendix removed. Small cigarette drain. Child kept on right side. Up on seventh day; home on twelfth. Present condition: well.

CASE CXXVIII.—June 11, 1908. B. F. Age twenty-eight. Multipara. Acute appendicitis. Transverse incision. Appendectomy. Up on first day; home on seventh. Present condition: well in June, 1909.

CASE CXXIX.—July 9, 1908. A. D. Age twenty-three. Married. Pregnant four months. Acute appendicitis. Transverse incision. Appendix, lymph covered and reddened, removed. Up on first day; home on eighth. Present condition: pregnancy not disturbed. July, 1909, reports well.

CASE CXXX.—March 18, 1908. M. O. Age forty-five. Widow. Acute appendicitis. Right rectus incision. Thickened, edematous, lymph-covered appendix removed. Up on third day; home on nineteenth.

CASE CXXXI.—November 25, 1908. C. P. Age twenty-three. Single. Acute appendicitis. Right rectus incision. Pus. Cigarette drain. Wound healed without infection. Up on twelfth day; home on fourteenth.

CASE CXXXII.—December 2, 1908. M. C. Age? Acute appendicitis. Right rectus incision. Up on second day; home on ninth.

CASE CXXXIII.—May 13, 1909. M. E. Age twenty-three. Married. Sterile. One year ago was curetted by a surgeon for profuse menstruation and since has suffered continual pelvic pain, increased during menstruation. Very tender over appendix. Adhesions about appendages. Transverse incision. Appendix removed acutely inflamed and distended with pus. Appendages practically normal except for slight, old adhesions which were freed. Up on second; home on tenth. Present condition: no pelvic pain, but has gonorrhea.

CASE CXXXIV.—November 4, 1909. L. G. Age twenty-seven. Married. One child. Acute appendicitis. Right rectus incision. Up on second day; home on fifth. Present condition: normal.

OPERATIONS FOR CHRONIC APPENDICITIS.

CASE CXXXV.—January 23, 1908. M. G. Age twenty-seven. Single. Flows profusely for two weeks each month. Pain and tenderness over appendix. Fistula in ano. No evidence of tuberculosis. Right rectus incision. Appendectomy. Curettage (hyperplastic endometritis). Fistula dissected out and closed by sutures. Up on third day; home on twelfth.

CASE CXXXVI.—February 6, 1908. M. D. Age twenty-eight. Married. Pain and tenderness over appendix. Right rectus incision. Appendectomy. Up on second day; home on eighth. Present condition: no pain; well.

CASE CXXXVII.—February 8, 1908. J. A. Age thirty-two. Married. Chronic appendicitis and salpingitis. Median incision. Appendix stuffed with fecal concretions to size of little finger removed. Right tube resected; left tube and ovary removed. Up on fourth day; home on twentieth. Present condition: well.

CASE CXXXVIII.—March 23, 1908. M. R. Age twenty. Single. Slight tenderness over appendix. History of two slight attacks of pain. Right rectus incision. Appendectomy. Up on third day; home on eighth. In tip of appendix bean-shaped mass of adenocarcinoma (Jeffries). Last seen one year later, well then.

CASE CXXXIX.—July 22, 1908. B. I. Age twenty-five. Married. Attacks with pain and tenderness over appendix. Right rectus incision. Appendectomy. Up on second day; home on eighth.

CASE CXL.—August 18, 1908. K. G. Age thirty-one. Married. Attacks with pain and tenderness over appendix. Right rectus incision. Appendectomy. Up on first day; home on sixth. Present conditions: well; pregnant.

CASE CXLI.—January 28, 1909. C. B. Age twenty-five. Married. One child. History of gonorrhea. Pain over appendix. Wants children. Transverse incision. Appendix, containing concretion, removed. Adhesions about tubes freed. Up on second day; home on eighth. Present condition: feels well.

CASE CXLII.—March 16, 1909. C. L. Age thirty. Married. Several abortions. Backache. Profuse menstruation accompanied by severe pain in the region of the appendix. No flow for six weeks. Very tender over appendix. Retroverted adherent uterus. Pregnant about six weeks. Left ovary cystic and prolapsed. Transverse incision. Appendix, congested and bound down by recent adhesions, removed. Uterus replaced. Morphia for pain. Much nausea. Aborted on fourth day, but continued to flow and on sixth day was gently curetted and uterus

irrigated with watery solution of iodine. No further trouble. Up on seventh day; home on tenth day.

CASE CXLIII.—April 14, 1909. A. S. Age twenty-six. Multipara. Chronic appendicitis. Right rectus incision. Appendectomy. Up on first day; home on seventh. No pain since; wound firm.

CASE CXLIV.—May 10, 1909. G. K. Age twelve. Attacks of pain over appendix for one year. Gibson incision. Appendix containing concretion removed. Up on second day; home on sixth.

CASE CXLV.—July 15, 1909. A. C. Age twenty-six. Married. Four induced abortions, last at six weeks, two months ago by midwife. Bleeding since. Pain in right lower abdomen. Movable cyst to right and anterior to uterus. Transverse incision. Appendix in mass of adhesions removed. Cyst of right ovary removed. Curettage. Up on second day; home on eighth. Present condition: no pain; feels well.

CASE CXLVI.—July 27, 1909. R. G. Age eighteen. Single. Attacks of pain in right lower abdomen for three years. Tender over appendix. Right ovary cystic. Gonorrhea. Transverse incision. Appendix buried in adhesions removed. Small right ovarian cyst removed. Up on second day; home on sixth. Present condition: no pain; general condition good.

CASE CXLVII.—September 9, 1909. I. D. Age forty-two. Married. One child seven years ago. Menstruation normal, last in February. Has since then had pain in right side. Uterus like seven months' pregnancy. Diagnosis (Dr. Tovey). Chronic appendicitis with pregnancy. Transverse incision. Thickened appendix removed. Up on third day; some crampy pains with bleeding on fourth day; put back to bed; home on tenth day. (See Case XXVIII.)

CASE CXLVIII.—September 9, 1909. B. H. Age thirty-five. Married. Pain in right side. Tender over appendix. Gibson incision. Appendectomy. Up on second day; home on sixth. Present condition: no pain; feels well.

CASE CXLIX.—January 20, 1910. R. R. Age forty-five. Multipara. Pain and tenderness over appendix. Backache. Bearing down. Pain on defecation. Right rectus incision. Appendectomy. Perineorrhaphy. Up on fourth day; home on eighth. Had to be catheterized for four days. Present condition: normal, except for persistent bladder irritation.

CASE CL.—March 31, 1910. F. E. Age twenty-five. Married. Operated three years ago for appendicitis. Now dragging pain on walking. Transverse incision. Thick band of adhesions from cecum to scar divided, and raw surfaces covered by peritoneum. Up on third day; home on ninth. Present condition: well.

CASE CLII.—April 7, 1910. R. C. Age thirty-six. Multipara. Pain on right side, extending down thigh. Uterus fixed by mass on right side. Transverse incision. Appendectomy.

Left multilocular cyst removed. Up on second day; home on seventh. Present condition: well.

CASE CLII.—April 21, 1910. S. C. Age thirty-eight. Married. Sterile. Pain in right side, extending into leg. Small mass to right of uterus. Transverse incision. Appendix and right ovary adherent; appendix removed; ovary freed. Up on second day; home on sixth. Present condition: well.

OPERATIONS FOR VENTRAL HERNIA.

CASE CLIII.—October 23, 1908. B. G. Age forty. Married. Operation for pus tubes two years ago; hernia following. Mayo operation. Up on fourth day; home on twelfth wearing Boldt binder. Present condition: well.

CASE CLIV.—October 22, 1908. L. Mc. K. Age thirty-one. Multipara. Very fat. Large ventral hernia following median abdominal section in 1907 (Dr. Tovey). Closed by overlapping fascia (Dr. Wells). Up on twelfth day; home on seventeenth. Hernia occurred. (See Case CLVI).

CASE CLV.—January 14, 1909. L. W. Age forty-seven. Widow. Obese. Had been operated on by Dr. Wells a year before by hysterectomy for large fibroid and now has a median ventral hernia the size of a child's head. Fascia freed and overlapped. Wound closed with through-and-through silkworm-gut sutures besides plain catgut for peritoneum and muscle and mattress sutures of number two chromic gut for the overlapped fascia. Considerable tension. Wound healed aseptically. Patient allowed to sit up on fourteenth day. The next day she had a severe fit of coughing and complained of pain in the wound and, on examination, it was found that her hernia had reappeared. She was fitted with a snug abdominal bandage which made her comfortable and no further attempt at operation was advised.

CASE CLVI.—July 1, 1909. L. Mc. K. Age thirty-two. First operation by Dr. Tovey in 1907 for double pus tubes. Median incision, healed by primary union. After she went home patient, who was a janitress, lifted a heavy barrel and felt her wound give way. Second operation by Dr. Wells at polyclinic, October 22, 1908. Fascia overlapped; primary union; but in a few months hernia reappeared. Third operation by Dr. Tovey at polyclinic, July 10, 1909. Wound infected, healed by granulation. Up on sixteenth day; home on twenty-first. Last seen two months after operation when wound was still firm.

CASE CLVII.—November 18, 1909. J. U. Age thirty-six. Married. Left appendages removed for pus in 1906. Supra vaginal hysterectomy in 1907. Noticed lump in scar six months ago. Hernia closed by overlapping fascia. Patient very fat; fascia friable; much tension. Severe shock; acute dilatation of stomach; tube passed; persistent vomiting; much distention. Fat suppurated. Up on twenty-fifth day; home on fortieth. June 1910: feels well. Lower angle of scar weak, wears bandages.

OPERATIONS FOR OVARIAN DISEASE.

CASE CLVIII.—April 13, 1908. F. B. Age thirty-eight. Married. One year ago a general surgeon did a vaginal hysterectomy for fibroid uterus. He found the ovaries adherent and enlarged, but could not remove them. Abdomen now distended to size of six months' pregnancy. Median incision by Dr. Wells. Bladder high up on mass pushed off with gauze. Tumor friable and densely adherent everywhere. Cleavage plane finally found and mass enucleated. It was now found that the left ureter was cut at the pelvic brim and stripped loose to the bladder, its blood supply being cut off. Ligature at pelvic brim and bladder. Vaginal drainage and Fowler position. Second day temperature and pulse only slightly raised, bowels moved, no distention, feels well, sitting up in bed, but passes only a small amount of smoky urine. *Died on seventh day of uremia.* No autopsy allowed.

CASE CLIX.—May 8, 1908. Age eighteen. Virgin. Profuse flowing for four months. Abdomen enlarged by cyst to size of seven months' pregnancy. Median incision. Necrotic looking, friable, adherent cyst containing brain-like material and blood clots removed piecemeal. Malignant type of adenocarcinoma (Jeffries). Up on fifth day; home on fourteenth. Recurrence and death in St. Vincent's Hospital in August, 1908.

CASE CLX.—September 24, 1908. A. B. Age thirty-five. Median incision. Left adherent ovarian cyst size of large orange removed. Right dermoid, same size, adherent deep in pelvis, removed. Ventral suspension. Up on second day; home on ninth.

CASE CLXI.—April 1, 1909. E. L. Age twenty-four? Married. Sterile. Neurasthenic. Constant pain in region of ovaries and sacrum, becoming more severe during menstruation. Marked tenderness over appendix. Ovaries prolapsed, enlarged, apparently cystic, and very tender. Transverse incision. Adherent appendix removed. Right ovary like a large pickle, 3 inches long and $1\frac{1}{4}$ inches thick, very white and containing many small cysts, was resected, about three-fourths being removed. Left ovary also very large and white, contained a clear cyst and a corpus luteum cyst size of a plum, was resected. The cut surfaces of both ovaries looked normal. Ovaries held up by Barrow's operation. Patient did well but refused to sit up until the sixth day; home on the fourteenth. Present condition: improved, but still has some pain and is neurasthenic.

CASE CLXII.—July 1, 1909. J. S. Age twenty-six. Married. One child. Abortion three years ago at four months by midwife. Complains of pain since, most severe on left side and in sacrum. Wants child. Small ovarian cyst to left; right appendages prolapsed and adherent. Tender over appendix. Transverse incision. Left ovarian cyst removed. Both tubes

removed. Appendix removed. Small tubercles dotted over tubes and appendix. Pink serous fluid in abdomen. Up on second day; home on seventh. Present condition: apparently normal.

CASE CLXIII.—August 12, 1909. E. S. Age twenty-eight. Married. Complains of pain in region of right ovary and pain on defecation. Has already undergone two abdominal sections. Cystic ovary to right of uterus size of peach; to left of uterus tender, indefinite thickening supposed, because of pain on defecation, to be an adherent sigmoid. Transverse incision. Dense adhesions between intestine, omentum, and pelvic contents. Right ovarian cyst removed. Adhesions between uterus and sigmoid separated with difficulty and only after serious injury to peritoneum of gut which was repaired. Other adhesions allowed to remain. Allowed to walk to toilet on second day. Home on eighth day. Present condition: well.

CASE CLXIV.—March 3, 1910. L. A. Age twenty-eight. Married. One child. Abortion three months ago. Dysmenorrhea. Backache. Bearing down. Uterus pushed back by smooth, rounded, fluctuant tumor rising nearly to umbilicus. Transverse incision. Right adherent cyst, tube, and appendix removed. Portion of left ovary saved. Up on second day; home on sixth.

CASE CLXV.—April 7, 1910. A. Z. Age twenty-four. One child five years old. Dysmenorrhea. Bearing down. Right ovarian cyst. Transverse incision. Multilocular cyst removed. Up on fourth day; home on tenth. Present condition. Has developed paraplegia; referred to neurological department.

CASE CLXVI.—July 3, 1908. M. H. Age twenty-five. Married. Sterile. Epilepsy. Pelvic pain. Prolapsed ovaries. Transverse incision. Barrow's operation. Appendectomy. Colon bacillus infection of wound found on fifth day; treated by Bier cup; healed on twelfth. Up on seventh day; home on twelfth.

CASE CLXVII.—October 10, 1908. E. R. Age twenty. Dyspareunia. Prolapsed ovaries. Transverse incision. Barrow's operation. Up on second day; home on tenth.

CESAREAN SECTION.

CASE CLXVIII.—March 31, 1910. S. M. Age twenty-two. Primipara. Cyst size of grape-fruit obstructing pelvis. Cyst because of its ribbed surface and a mass feeling like bone thought to be a dermoid. Pregnant at term. Cesarean section. Placenta under incision. Child and placenta delivered with membranes intact. Cyst removed. Morphia for pain. Highest postoperative temperature 100.6°; pulse 80. Pathologist (Dr. Jeffries) reports cyst to be a papilloma. Up on tenth day; home on fourteenth day. Mother and child well.

ADHESIONS AFTER VENTRAL FIXATION.

CASE CLXIX.—May 22, 1909. M. S. Age forty-one. Multipara. Very fat. Several years ago she had an operation done for prolapse, the operator fixing the fundus of the uterus to the abdominal wall midway between the umbilicus and the symphysis. She now has complete prolapse of uterus and vagina. Sound can be passed into prolapsed uterus $7\frac{1}{2}$ inches. Vaginal incision from cervix to urethra; bladder freed from vagina and uterus; peritoneum opened and attempt made to deliver fundus. The very dense adhesion of fundus to abdominal wall could not be safely reached from below, so the abdomen was opened by a median incision through the old scar and a firm band the size of a finger divided. The operation was finished through the vagina by amputation of the cervix, implantation of the fundus under the bladder by Watkins' method, and repair of the perineum by direct suture of the levator muscles. Patient was allowed up on the twelfth day and home on the fourteenth. Present conditions: comfortable, but when erect, uterus sags down so that the cervix touches the firm perineum.

EXPLORATORY.

CASE CLXX.—January 24, 1908. M. A. Age thirty-eight. Widow. Bleeding from vagina for four months. Carcinoma at internal os. Median incision. Metastases. Radical operation not considered advisable. Abdomen closed. Up on fourth day; home on tenth. Treated later by acetone with temporary improvement of symptoms.

CASE CLXXI.—January 25, 1910. M. C. Age forty-eight. Thin and weak. Severe pain when bowels move. Mass to left and behind uterus. No leukocytosis. Transverse incision by Dr. Wells. Exploration showed inoperable carcinoma of sigmoid. *Died on third day* of exhaustion and possible ileus.

DEATH ON TABLE FROM HEART FAILURE.

CASE CLXXII.—March 18, 1909. L. W. Age forty. Multipara. Menstruation regular and normal until ten years ago, when she began to flow more than usual. Now flows profusely every three weeks with spotting after intercourse or digital examination, or after being on her feet or walking. Foul-smelling vaginal discharge. Has lost weight. Severe pelvic pain and backache. Cured October, 1908. Microscope shows no evidence of carcinoma. Curetting relieved her hemorrhages until January, 1909, when she had an attack of pain and fever with a mass in region of appendix. Uterus enlarged by fibroid nodules so that fundus is 2 inches above symphysis. Tender mass on left side of pelvis reaching above pelvic brim. Much exhausted by the continuous pain and bleeding. Urine normal.

Heart slightly enlarged; apex beat in nipple line; systolic murmur heard over apex and below angle of scapula; pulmonic second sound accentuated; pulse slightly irregular. As her mitral regurgitation seemed to be well compensated and she had been under observation for over two years, it was decided after consultation to risk operation. Ether was given by a very skilled anesthetist. Transverse incision (by Dr. Wells). Peritoneal cavity contained considerable red, jelly-like exudate. Fibroid uterus with diseased appendages and left ovarian cyst. To facilitate clearing of operative field patient was raised to a moderate Trendelenburg position, and died instantly with heart in diastole. Autopsy refused.

523 MADISON AVENUE, NEW YORK.

REPORT OF THE COMMITTEE OF THE AMERICAN
GYNECOLOGICAL SOCIETY ON THE PRESENT
STATUS OF OBSTETRICAL EDUCATION IN
EUROPE AND AMERICA AND ON RECOM-
MENDATIONS FOR THE IMPROVE-
MENT OF OBSTETRICAL TEACH-
ING IN AMERICA.

President of the American Gynecological Society and Fellows:

Your Committee has received reports from Great Britain, Germany, Austria, Switzerland, France, and Italy. In contrast with the present system in those countries, a report is submitted from seven representative medical schools in the United States, which may be fairly classed among the best medical schools in this country.

GREAT BRITAIN.

A course of lectures, thirty to forty or more each year, is given in obstetrics in all London schools. It usually extends over two years, and lectures on gynecology are given at many schools in addition to those in obstetrics. You will find details as to hours in the *British Medical Journal* for September 4, 1909.

The work in obstetrics consists of the above lectures, clinical teaching in the obstetrical wards (most of the general hospitals now have beds for this numbering from eight to twelve). A class of practical obstetrics, demonstrations in the museum, personal attendance on about fifty cases each student, the number varying with the different hospitals. Each student

must attend twenty cases, and in addition each university student (Oxford and Cambridge) must have previously attended cases in the lying-in wards for at least one month.

The teachers of obstetrics also teach diseases of women and their surgical treatment; they are the only teachers who do teach this subject in the medical schools for men students.

(Signed) HERBERT SPENCER.

GERMANY.

I have arranged the instruction in obstetrics and gynecology in the University of Königsberg as follows:

Sixth Semester.—Theoretic obstetrics.

Seventh Semester.—Obstetrical-gynecological clinic (as spectator); a course in gynecological diagnosis. A course in examinations of pregnant women.

Eighth Semester.—Obstetrical-gynecological clinic (as practitioner). A course in obstetrical operations on the manikin.

Ninth Semester.—Obstetrical-gynecological clinic (as practitioner). A course in microscopical diagnosis. A practical course in minor gynecological therapeutics. The physiology and pathology of the new-born infant.

Tenth Semester.—Obstetrical-gynecological clinic. Course in obstetrical operations. Course in cystoscopy. Physiology and pathology of the puerperium. A demonstration, weekly, for nine weeks of pathological anatomy (with the epidiascope, microscope, etc.).

Each student in the tenth semester must live a month in the clinic where he observes and conducts about forty labors and performs the minor operations.

(Signed) PROFESSOR WINTER.

AUSTRIA.

Of the five years' course, the student must occupy himself during one year with obstetrics and gynecology. During this time, he is obliged to attend the lectures ten hours a week. During this time also he must have his practical training, in which he has the opportunity to see a large number of labors and to perform minor operations, such as perineal lacerations, episiotomy, manual extractions, etc.

There is manikin practice in the obstetrical operations.

In addition, he receives practical training in the examination

of pregnant women and gynecological patients. The examination consists of diagnosis in parturient and pregnant women and in gynecological patients and operations performed upon the manikin.

HEINRICH PEHAM,
University Professor of Obstetrics and Gynecology, Vienna.

SWITZERLAND.

1. During the customary ten-semester medical course, three to four semesters are devoted to obstetrics and gynecology. Three semesters are obligatory.

2. During this time the students visit the obstetrical-gynecological clinic and polyclinic where opportunity is afforded them to observe gynecological cases, to examine pregnant women, and thus to acquire the necessary technical skill.

In addition, a certain proportion of the students attend the theoretical lectures on obstetrics and gynecology, which are not obligatory.

The obstetrical operations are practised upon the manikin, and in addition the students occasionally have the opportunity to perform these operations upon the living patient under the supervision of an instructor.

In the final examination there is required:

1. Practical demonstration of sufficient knowledge in the examination of pregnant and parturient women and of gynecological patients.

2. The performance of several obstetrical operations on the manikin.

3. A theoretical oral examination on obstetrics and gynecology.

TH. WYDER,
Director of the University Frauenklinik, Zürich.

FRANCE.

In answer to your letter of November 26, I went to see Professor Lannelongue, one of the leading surgeons here, also a member of the "Institute" of France and Senator. The following is a translation of the answers he dictated to me after reading the questions of your letter:

"Two terms of six months each are devoted to the study of midwifery and obstetrics. The students of the two clinical

departments are inscribed turn about night and day to make a stage in the hospital wards and follow the labor hour by hour till period of delivery. During a term they can follow about fifteen cases or more if they wish to do so.

"The scope of the course in obstetrics includes not only delivery proper, but also all the medical or surgical treatment of woman's diseases, such as, for example, fibromes, disease of the ovaries, of the large ligaments, etc.

"In France the courses are no more given in a theoretical way, but are principally practical demonstrations either in the lecture rooms or in the hospitals (woman's wards). All apparatus or instruments for demonstration are used, manikin work, word work, polyclinic service, touch courses, etc.

"In one word the teaching is very complete and great stress is laid on the assiduity of candidates. One can say that after their two terms of practically a year's duration, the students are quite qualified to undertake any kind of delivery and have a sufficient knowledge of women's diseases from a practical view as from a scientific one, this study being far from neglected."

ITALY.

In Italy there are schools for obstetrics and gynecology for physicians annexed to all the universities. Equally in all the universities are annexed schools for midwives. In Florence there is the Superior Institute for obstetricians and physicians.

The course of obstetrics is of one year for the physicians (the full university course for physicians is six years) and the course of obstetrics is by rule assigned at the sixth year. For midwives the course is of two years.

The character of teaching is theoretic and experimental (clinic) and comprises also the assistance of women in labor made by the teachers or by their assistants.

The course includes also diseases of women and their operative treatment, as well as the physiology and pathology of the child-bearing process.

The theoretical instruction is given three times a week for the students in medicine, while it is daily for the midwives. The clinical practice is daily for everybody.

The students in medicine and the midwives cannot perform any operation before the end of their course of studies.

The examination is only theoretic.

COLUMBIA UNIVERSITY.

COLLEGE OF PHYSICIANS AND SURGEONS,
MEDICAL DEPARTMENT.*Course in Obstetrics.*

Second year.	Hours.
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Recitations and demonstrations (once a week for thirty weeks)	30
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Third year (first half).	
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Didactic lectures (twice a week for one-half year)	30
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Clinical lectures (once a week for one-half year)	15
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Fourth year.	
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Practical instruction in hospital and tenements.	
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(a) Three weeks' service in hospital; two weeks being spent on day duty and one week on night duty. During this term of service each student receives daily bedside instruction and makes antepartum examinations, both abdominal and vaginal, on from fifty to sixty pregnant women. Moreover, the students on duty receive a daily clinical lecture and manikin instruction from an instructor in obstetrics who is the resident obstetrician.

(b) Two weeks' service in the tenements; one week being spent on day duty and one week on night duty.

Each student during his five weeks of practical service delivers personally on an average seven or eight cases and sees from forty to fifty deliveries.

COLUMBIA UNIVERSITY.

Course in Gynecology.

Third year (first half).	Hours.
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Recitations once a week for fifteen weeks	15
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Second half.	
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Didactic lectures twice a week for fifteen weeks	30
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Clinical lectures once a week for fifteen weeks	15
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Fourth year.	
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Practical instructions in small sections in dis- pensary and hospital, twenty-six hours for each student	26
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(Signed) E. B. CRAGIN.

CORNELL UNIVERSITY MEDICAL COLLEGE,
NEW YORK CITY.

Plan of Instruction in Obstetrics.

January, 1910.

Second year.	Hours.
Recitations thirty-two hours	32
Third year.	
Section and manikin work.....	16
Clinics.....	16
Illustrative lectures	32
Recitations	32
	<hr/>
	96
Fourth year.	
Clinics	16
	<hr/>
Total	144

In addition students are required to reside for at least two weeks in the Manhattan Maternity or other hospital and personally confine at least six women.

J. CLIFTON EDGAR.

HARVARD MEDICAL SCHOOL.

MEDICAL DEPARTMENT OF HARVARD UNIVERSITY,
DEPARTMENT OF OBSTETRICS AND GYNECOLOGY.

A. Course in Obstetrics.

Third year.	Hours.
Lectures on the theory and practice of obstetrics, twice a week.....	64
Recitations, once a week.....	32
Conferences, once a week.	32

Clinical Instruction.

Each student spends two weeks in hospital residence, devoting his whole time, day and night, to his obstetric opportunities. He sees operations and normal deliveries, and under supervision and instruction he personally attends from six to ten out-patient cases. After his two weeks of residence he is required to devote a part of his time for a

week or more to completing the visits on his patients and writing reports of his cases.

Fourth year.

(In the Harvard Medical School the work of the fourth year is elective; but all students intending to practice medicine elect obstetrics.)

The class-work is in sections of from six to ten, and each student in obstetrics devotes his entire time for a month. For two weeks he is in hospital residence, and attends from six to ten out-patients, under supervision and instruction. After his period of residence, he completes the visits of convalescence and reports on his cases. There is a clinical lecture and ward visit every forenoon (except Sunday), at which the student has opportunity for antepartum examinations (inspection, palpation, auscultation, pelvimetry, and estimates of size of fetus, for witnessing normal and operative deliveries, for studying puerperal convalescence and the care of young infants. Each student has also a course of instruction, with manikin and fetal cadaver, in which the various obstetric operations are demonstrated and repeated by the student. Each student also writes a thesis on an approved subject of his choice.

(Many of the Harvard students make use of the opportunities afforded by the summer courses of the Harvard Medical School, and thus increase their clinical training. In addition to the many cases witnessed, the graduates of 1909 attended personally an average of twenty-three cases.)

B. Course in Gynecology.

Third year (second half).

Hours.

Lectures or recitations, twice a week, 32

Clinical exercises in small sections.

Each student attends six clinics, lasting from one and one-half to two hours. In these clinics the student is instructed in physical examination, diagnosis, and the treatment of ambulatory cases.

Fourth year (elective, taken by a large part of the class.)

Instruction is given in sections of from six to ten students, and each student devotes his entire time during the forenoons of two months. The work is clinical, and is given in the wards and out-patient department of the Boston

City Hospital. Opportunity is afforded for practice in history taking, examination, diagnosis, and minor treatment in the out-patient department. In the house service the student hears clinical lectures daily, has opportunity for physical examinations, and witnesses operations with demonstration; he follows the convalescence of cases, and each in turn assists in the work of the resident staff. Each student also has abundant opportunity for the study, under supervision, of pathological specimens removed in his presence by operation, and each student writes a thesis on an approved subject of his choice.

(Signed) C. M. GREEN.

JEFFERSON MEDICAL COLLEGE,
PHILADELPHIA.

Course in Obstetrics.

The anatomy and physiology of reproduction fully taught by the departments of anatomy and physiology in the first two years. Embryology and histology are included in this teaching.

Third year.	Hours.
Three didactic lectures and recitations weekly . .	90
Demonstration with the manikin and diagnosis, obstetric manipulations and vaginal deliveries . .	18
At least one case of spontaneous parturition in hospital, fully demonstrated by an instructor . .	
Fourth year.	
Lectures to the entire class, one weekly.	30
Hospital ward classes with the examination of pregnant patients, the study of complications of pregnancy, the puerperal period, normal infancy, and complications.	16
Clinical conferences in hospital with study of cases.	24
Demonstrations of hospital cases by instructors to small groups of students.	16
From two to six cases delivered in tenements and under supervision and instruction.	
Written reports of these cases with quizzes upon the reports by a demonstrator.	

Record of all work done during the senior year, which record with final examination constitutes final grade for securing a degree.

E. P. DAVIS.

JOHNS HOPKINS UNIVERSITY, BALTIMORE.

Courses in Obstetrics.

Third year, obligatory course.

Recitations and demonstrations twice weekly for thirty-three weeks, sixty-six hours.

Manikin work, once a week for thirty-three weeks, thirty-three hours.

Ward rounds and clinics in groups, once a week for sixteen weeks, sixteen hours.

Examination of pregnant patients in groups once a week for sixteen weeks, sixteen hours; total 132 hours.

Obligatory attendance of at least five cases of labor under supervision in the ward.

Optional work and courses in obstetrical histology and pathology, two hours a week for eleven weeks, twenty-two hours.

Fourth year, elective work.

Repeated every eleven weeks to not more than ten students each time. Each course occupies ninety-nine hours, not including obligatory attendance on at least ten cases of labor in the out-patient department and attendance at as many operations in the ward as feasible. The course consists of:

Hours.

Ward rounds	11
Conferences	11
Discharge examination of puerperal women ..	11
A practical course in pelvimetry	11
A laboratory course in infant feeding	11
Nursery rounds	11
A practical and laboratory course on the tox- emias of pregnancy	22
A course in comparative placentation	11

I might add that many of the students in these groups see from twenty-five to forty outdoor deliveries. In each case they

are accompanied by an assistant and a trained nurse, and I find that such training is even more valuable than the ward deliveries. They also make visits for the first five, the seventh and tenth days of the puerperium in normal cases, and as many visits as may be necessary in abnormal cases.

These visits are checked in two ways; first, by having the student leave a daily written report in the letter box of the resident obstetrician, and, second, by having the nurse, who makes daily visits for ten days render a similar report.

J. W. WILLIAMS.

UNIVERSITY OF CHICAGO.

The subjects of obstetrics and gynecology are taught in the junior and senior years in laboratory, recitation, and conference courses, in dispensary and hospital clinics, and in the conduct of labor in the homes of patients. Students are obliged to commence their studies by taking the laboratory and recitation courses. Final examinations in both courses are compulsory.

Obstetrics.

1. Conference course on normal pregnancy, labor, and the puerperium. A lecture and recitation course. Each section limited to forty students.
2. Clinical conference on normal pregnancy, labor, and the puerperium. Prerequisite: course 1. Limited to forty students.
3. Clinical conference on the pathology of pregnancy, labor, and the puerperium. Prerequisite: courses 1 and 2. Limited to twenty-five students.

Senior year.

4. Practical obstetrics. Prerequisite: courses 1, 2, and 3. Limited to fifteen students.

Clinical Obstetrics.

In the maternity department of the Presbyterian Hospital, Charity Hospital, Chicago Lying-in Dispensary, Chicago Maternity, and Central Free Dispensary. Prerequisite: courses 1 and 2. Throughout the year. Attendance upon cases of confinement in various hospitals and at the homes of patients is required of each student before graduation. Each student will be sum-

moned to cases at the time of delivery, and will attend the patients during and after delivery, under supervision. Clinical records must be kept by students and certificates obtained for attendance on five cases.

Gynecology.

Junior year.

6. Laboratory and recitation courses: Limited to twenty-five students.

Junior and senior year.

7. Clinical conference: Prerequisite: course 6. Limited to forty students.

8. Dispensary clinics: Conferences in practical gynecology, limited to four in each section. Prerequisite: course 6. Twenty-four hours. 4 M. Each term throughout the year.

Senior year.

9. College clinics: In gynecology and obstetrics. Prerequisite: course 6. Forty-eight hours. 4 Mj. Each quarter throughout the year.

10. Special laboratory work: For a limited number of students selected by the department staff.

Our teaching methods have been gradually changing in the last ten years. Systematic lectures have been entirely or almost entirely abolished and we have endeavored to instruct our students in small classes. Twenty-two majors of work are required in the junior and senior years, three being necessary in obstetrics and gynecology (at least two majors in obstetrics are required). Most students voluntarily take more than the requisite three majors.

The faculty feels strongly that there should be an extra fifth year in which more clinical instruction could be given. However, as all our graduates are able to obtain internships, we feel that we are better off than most medical schools.

The enclosed statement of departmental work gives a detailed account of our method of instruction.

We feel that the number of obstetric cases which should be attended by students is too small. It should be at least twelve. We intend to increase this requirement as our clinical facilities improve.

J. C. WEBSTER.

UNIVERSITY OF PENNSYLVANIA, MEDICAL DEPARTMENT.

Course in Obstetrics.

Third year.	Hours.
Clinical lectures twice a week	60
Demonstrations of abdominal palpation, pelvimetry, etc., to individual students, each.	1
Attendance on a patient in the Hospital under supervision and visits daily for two weeks afterward, average	24
Recitations, voluntary (quiz).	
Fourth year.	
One clinical lecture a week for half the year.	18
Two weeks of ward class instruction for two hours a day	24
Six demonstrations on the manikin to sections,	6
One week's residence in the south-eastern dispensary for out-patient work.	
Number of labors attended by each student:	
Average, seven.	
Recitations, voluntary (quiz).	

SCOPE OF INSTRUCTION.

The physiology and pathology of the child-bearing process including all the complications and pathological consequences at all periods, and their treatment, medical and surgical.

B. C. HIRST.

RECOMMENDATIONS.

We recommend that the teaching of obstetrics should occupy at least two years of the medical course, and that those expecting to practise obstetrics should be urged to avail themselves of elective opportunities.

That the number of labor cases personally attended by each undergraduate student should be at least six, under supervision and instruction.

CHARACTER OF INSTRUCTION.

We recommend all the known methods of teaching this branch of medicine, namely:

Didactic lectures,
Clinical lectures,
Clinical conferences,
Ward classes and touch courses,
Hospital and out-patient instruction,
Manikin practice in operative obstetrics,
And recitations.

Of the first three methods, we recommend specially clinical lectures and conferences.

We recommend that ample facilities should be afforded students to make antepartum examinations, including inspection, abdominal palpation, pelvimetry, fetometry, vaginal examinations, etc.

We recommend that a two weeks' hospital residence should be required before the out-patient practice.

SCOPE OF INSTRUCTION.

It is recommended that as obstetrics at present includes pregnancy and parturition, their complications and consequences, and the complete recovery of the women after labor, that obstetric instruction should include the medical and surgical treatment of these conditions.

The tendency of obstetrics to become more surgical in practice and to require a surgical training is evidenced by the fact that in the medical schools of Europe and in more than one-third of the first fifteen medical colleges of this country,* the chairs of obstetrics and gynecology are combined under one head.

(Signed) E. B. CRAGIN,
J. C. EDGAR,
C. M. GREEN,
E. P. DAVIS,
J. W. WILLIAMS,
J. C. WEBSTER,
B. C. HIRST, Chairman.

*Columbia, Cornell, Jefferson, Medico-Chirurgical, Tulane, Yale, Long Island, Harvard, Johns Hopkins, Rush, Bellevue, Western Reserve, Michigan, University of Pennsylvania, and California. Of these fifteen medical schools, six have combined chairs.

THREE CASES OF CARDIAC LESION COMPLICATING PREGNANCY AND LABOR.

BY

ELMER SOTHORON, M. D.,

Washington, D. C.

CASE I.—Mitral regurgitation. Mrs. E., white, age thirty-five, multipara, with a history of an acute attack of rheumatism, lasting six weeks, when twenty years of age, engaged my service at the third month of her approaching confinement.

Her general physical condition during her period of pregnancy up to January 4, 1904, two weeks previous to her confinement, was excellent. Bi-monthly examinations of her urine, negative. Examination of her heart revealed no typical lesion with the exception of a somewhat quickened pulse and an aggravated first heart sound. On January 4, 1904, two weeks previous to her confinement, she had an attack of dyspnea, some cough, with a pulse small in volume and running up to 120. Under regular routine treatment her condition greatly improved. During this attack by careful examination a faint mitral murmur could be heard at the apex of the heart. I saw her the day before her confinement. Her condition and spirits were good. The next day, January 19, I was telephoned to see her at once, as she was in labor and had several "sinking spells." On my arrival I found her in severe labor pains, os well dilated, marked dyspnea, and pulse weak and about 120. I gave her $\frac{1}{30}$ of a grain of strychnine hypodermically for two reasons—for its influence upon the action of the uterus as well as the heart. She obtained slight relief for about two hours when her dyspnea returned with some cyanosis. As the head was well down in the pelvis she was immediately prepared for forceps delivery, and during the preparation her pulse increased to 140 and was very weak, dyspnea and cyanosis becoming more marked. She was again given $\frac{1}{30}$ of a grain of strychnine, and delivered by forceps in a semirecumbent position. Normal delivery of placenta and firm contraction of the uterus. Pulse after delivery dropped to 110. Some dyspnea and slight cyanosis continuing. I remained at her home all night. She was given regularly $\frac{1}{30}$ of a grain of strychnine. Her condition remained as just mentioned for five days. Dr. Geo. N. Acker saw the case in consultation on the sixth day after delivery. Her condition remained the same from day to day with excessive and prolonged dyspnea and some cyanosis and a very quick and weak pulse, running up to 140. Strychnine, sparteine, and whiskey were used faithfully. On the twenty-third day of February she was removed to Garfield

Hospital and after her fifth day in the hospital began to show marked improvement. On March 17 she left the hospital much improved, pulse 86, respiration 20. Her health at the present time is excellent and a month ago I examined her heart and could not detect any distinct murmur.

CASE II.—Mitral stenosis. Mrs. B., white, age twenty-eight, primipara; history of a severe attack of rheumatism while a girl of sixteen years. I was not called to attend her until the seventh month of her pregnancy. She was very anemic and weak. Could not walk across the floor without marked dyspnea. Examination of urine, negative. Pulse rapid, irregular, and weak. Upon examining her heart I found a typical purring murmur could be distinctly heard terminating in first sound of heart's action, the organ showing signs of compensation breaking down, or, in other words, infection and weakening of the remaining healthy tissues of this organ. She was put to bed, absolute rest and quietness ordered. Small repeated doses of calomel were given until the bowels moved freely. Digitalis was given regularly that day and night. I saw her the next day, some slight improvement in heart's action. This condition continued. As she was approaching her eighth month of pregnancy and, as there was no improvement in the condition of her heart, I impressed upon her family the necessity for the immediate induction of labor. To this procedure they would not give their consent, insisting upon my waiting a few days longer. Two days later I was called hurriedly to her home and found she had, about an hour before my arrival, an attack of hemiplegia—right side—no doubt due to embolism. Dr. Acker saw the case in consultation the next day. Three weeks later labor began and I delivered her with forceps of a living child. Eight months after her confinement she died from general exhaustion and valvular lesion of the heart. I feel that if premature labor had been induced in this case her attack of hemiplegia might have been prevented.

CASE III.—Aortic insufficiency. Mrs. G., age twenty-four, white; primipara, with a history of scarlet fever and whooping-cough while a child. I had attended this young woman for four years previous to her marriage, and knowing the condition of her heart I advised her mother to persuade her not to marry. I censure myself for not making my plea stronger and directly to her as she was a very intelligent woman and I believe would have listened. Her heart from the second month of pregnancy seemed to periodically lose its compensation. About every six weeks or two months she would have attacks of coughing, dyspnea, and a very rapid pulse. A soft bruit could be heard over the upper portion of the sternum. With rest in bed for a week or so and the use of digitalis the attacks would wear off. Her heart would improve in action. Three days previous to her (full term) labor she had an attack of dyspnea, and coughing, pulse rising to 140, rapid, irregular, and weak. Digitalis and

whiskey were given regularly. Next two days some improvement. On the third day after this attack labor commenced and, as she seemed to be somewhat free of dyspnea, pulse fairly good, no attempt was made to hasten delivery. About the time the head began to descend upon the perineum she began to complain of shortness of breath, with weak and rapid pulse. One-thirtieth of a grain of strychnine was given her and she was immediately delivered with short forceps. After completion of her labor her condition improved. Dyspnea grew less and heart action better. This improvement was of short duration. About five hours after her delivery dyspnea became pronounced, heart's action very bad and in spite of careful nursing and attention this condition continued until the fourteenth day when death ensued. This woman should never have married. I believe interruption of her pregnancy in its early stage would probably have prolonged her life.

The average obstetrician will acknowledge that an aggravated cardiac lesion is a most serious complication of pregnancy and labor. Should a woman who has valvular lesion marry? I believe it is our duty to advise as strongly as we can against such a step. It is a grave question and the responsibility must necessarily rest upon us. There are many cases of so-called compensated valvular defects during pregnancy where the risk is enormous, and where we are not justified in advocating full-term delivery. On the other hand, the average physician with a fair amount of obstetrical experience will mention cases where mothers have gone to full term without ill effects, although suffering from a serious heart lesion; but this is not good reason why women suffering from a serious lesion can or should be allowed to run the risk of full term. Feller, in his investigation of cardiac lesions in these cases, claims that only 14 per cent. of these complications are recognized and that they are overlooked in 86 per cent. Leyden claims that 40 per cent. of all women who suffer from cardiac lesion meet death at the time of pregnancy or labor. All writers agree that mitral lesions, especially stenosis, are most frequently met with in this class of cases. Osler states this lesion is much more common in women than in men. Sixty-three of eighty cases noted by Duckworth were in women.

Most writers in dealing with this subject do not venture a pronounced opinion. They endeavor to enlighten us with research or clinical investigation to a certain point and then cover up with the simple remark, if compensation is good our patient may go to full term and labor without ill effect. Now, the compensation in a diseased heart before, or at the beginning

of, pregnancy is not the same compensation as in the latter months of pregnancy or labor. When we are called suddenly to see a cardiopath in the latter part of pregnancy or labor who has an uncertain cardiac lesion, with only fair compensation, slight dyspnea and a weak rapid pulse, we censure ourselves for letting our patient reach this stage of ill effect, for we should have realized the changes that must take place in the circulatory system of the mother. The sudden strain on compensation in this class of cases is always a great danger.

1921 I STREET, N. W.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of April 12, 1910.

The President, R. L. DICKINSON, M. D., in the Chair.

DR. J. VAN DOREN YOUNG presented a specimen:

"ADENOCARCINOMA OF THE FUNDUS UTERI."

Mrs. G. R. Seen by me December 26, 1909. Age fifty-one. Single. Family history negative. Previous health good. Menstrual history profuse with clots; irregular, twenty-one to ninety days; last period, November, was profuse in character; has had irregular leakage of blood for the past three years; complains of bearing-down aching pain, severe and constant, located in lower abdomen and lumbar region; has increased steadily for the past three years. Has had leucorrhea for the past eighteen years, latterly has become streaked with blood, profuse with slight odor. Bladder has been irritable for the past three years. No loss of flesh and no disability. Examination on December 26 showed patient well nourished, anemic, no cachexia. Gynecological examination: cervix hard, uterus enlarged and slightly irregular in outline. Diagnosis of multiple small fibroids with probable malignancy. Examination of the urine showed traces of albumin with casts. Taking into consideration the patient's age, the irregular hemorrhage, and the character of the discharge, laparotomy and panhysterectomy was performed at St. Elizabeth's Hospital December 30, 1909. The patient made an uneventful recovery and is now in good health. The specimen was examined by Dr. Sondern, who returned diagnosis of adenocarcinoma.

Macroscopically and microscopically the growth is limited to the fundus of the uterus, its appearance is characteristic, involving the uterine wall over the upper third, both anterior

and posterior. Its progress has been much more marked in the fundus and the specimen shows well the thinning out of the uterine wall, and demonstrates the danger of perforation. A few small fibroid nodules may be seen in the uterine wall. Laparotomy was performed without a positive diagnosis of malignancy and on account of the typical history taken together with the age of the patient, and the irregular outline of the uterine body. When the abdomen was opened the feel of the uterine body confirmed the diagnosis, and panhysterectomy was performed.

There are four points of interest in the case:

1. That the serious nature of the condition was recognized early in the case by her physician.
2. The operation of panhysterectomy was performed with only symptoms and history, and feel of the uterus at time of operation to guide.
3. The danger of the curet as a means of positive diagnosis, both from perforation of the wall and spreading of cancerous cells.
4. The operation was justified by the pathological findings and no risk run of spreading of cancerous cells. How often is this possible?

DISCUSSION.

DR. BOLDT.—I am particularly interested in carcinoma of the uterus and especially carcinoma of the body of the uterus, for several reasons. During the past two weeks I have had an opportunity to remove two uteri, the seat of malignant disease of the uterine body. In both instances the patients had been treated some time for other troubles by their physicians. It is indeed remarkable that, in spite of the fact how much is known about this condition, some physicians continue to treat such patients with uncertain diagnoses.

In regard to this particular instance presented by Dr. Young, I have several little points I want to call attention to. In the first place I do not see that the adnexa have been removed, the ovaries are not present.

DR. YOUNG.—It was a complete hysterectomy, doctor.

DR. BOLDT.—That disposes of that question. In cancer of the body of the uterus I invariably remove the adnexa with the uterus. Moreover, in cancer of the body of the uterus this is positively indicated. Probably the better operation is to do the vaginal operation rather than the abdominal operation. That, of course, does not hold good for cancer of the cervix, but only for cancer of the body of the uterus. I fail to see that there is any indication why the abdominal should have preference over the vaginal operation.

I am under the impression Dr. Young will find very few who would be of his opinion even in the case of a woman presenting

symptoms as this woman did without a more positive diagnosis. We can make a diagnosis by using the curet, and subsequently the examination of the scrapings if in adult. Although the doctor has brought out the point why the curet should not have been used in this case, it does seem desirable to make a positive diagnosis, because there are other conditions which give similar symptoms. So I plead that in the absence of more positive diagnosis than symptoms we should not proceed until the diagnosis has been determined on with more certainty.

DR. BRETTAUER.—I agree with Dr. Boldt as to operating without positive diagnosis on a woman fifty-one years old who has fibroids. I do not see much danger in the use of the curet as an exploratory measure. You do not have to curet very deeply to get sufficient tissue for microscopical examination. Very recently I operated upon a woman of sixty-nine for a beginning carcinoma of the uterus where the symptoms were of such a character as to admit of a positive diagnosis. However, without dilating the uterus I removed some particles with a small curet, for verification of the clinical diagnosis.

DR. CRAGIN.—One fact has impressed me within the past winter and that is the relative frequency of carcinoma of the body of the uterus as compared with what we formerly supposed to be the rule. It is generally thought that the proportion of carcinoma of the body is very small as compared with carcinoma of the cervix. Yet in my experience this last winter I have seen as many cases of carcinoma of the body as of the cervix. Of course that number is small in the experience of any one man, and yet in the last month I have operated in private twice for carcinoma of the body, and in that same time I have seen only two cases of carcinoma of the cervix at the Vanderbilt Clinic. That is just in the experience of one man and in one clinic, but we may well consider the fact that on the one hand carcinoma of the body is quite frequent and on the other that the results of operation on carcinoma of the body are infinitely better than a carcinoma of the cervix.

This specimen exhibited by Dr. Young with its rim of comparatively healthy uterine tissue about the disease seems to give us the reason for that apparent safety after operation. Cases you think at the time are almost hopeless often will go for years without any recurrence. Hence the hope we have in operating for carcinoma of the body, if we can do it by the vaginal method, as most of us prefer, which gives less shock, and I think rather less likelihood of infection of surrounding tissue than by the abdominal method. These seem to me to be points in favor of carcinoma of the body as compared with carcinoma of the cervix.

DR. HOWARD C. TAYLOR.—Without going deeply into the question of the vaginal or abdominal route in cases of carcinoma of the fundus, my choice is to operate through the abdomen rather than through the vagina. I have felt that in handling

a case of carcinoma of the fundus there is a distinct possibility of forcing more or less of the cells out into the other tissues. If we operate through the abdomen we can have the lymphatics and blood-vessels tied off pretty well before the uterus is handled to any great extent, and there is much less danger of forcing the cells of carcinoma out into the tissue of the body.

In regard to the question of positive diagnosis before removing the uterus in suspected cases of carcinoma of the fundus, I think we should be very sure of the diagnosis before advising the removal of the uterus, but I think we can often make that diagnosis with the curet without microscopic examination. The character of the pieces of tissue removed with the curet is often such that the diagnosis can be made with practical certainty. It is not a good plan to stir up malignant tissue and then wait even a few days before the removal of the diseased organ.

DR. WYLIE.—Early diagnosis is most important. If the curet is used even a few days before operation, you will stand a chance of infecting the case deeper in. I am satisfied many times when you take a piece out and examine it the disturbance to the lymphatics will permit cancer to go to the adjoining tissue. A cancer never disturbed has a very much better chance in operation.

As to the choice of operation I prefer the vaginal route, as by operating that way we can make the cases suppurate afterward, the more marked the better result.

There is no question that suppuration is antagonistic to cancer tissue, and if you can get it up and have free drainage, there is very little danger by the vaginal method.

DR. DICKINSON.—As to prompt diagnosis, it is not desirable in malignant endometriums to curet and tear tissues wide open, and then two or three days later do the hysterectomy. If your freezing microtome is within easy reach, and in a case such as this one presented here to-night, you can get a prompt diagnosis. It happened, recently, that I had three malignant uteri of relatively early date to take out in one day. The first case was bleeding persistently, had an eroded ugly looking cervix, clinically malignant. The section turned over to the pathologist was all right, but the curettings were said to be malignant, and it turned out to be a uterus resembling this one not a little. The other two were found to be both clinically and microscopically malignant.

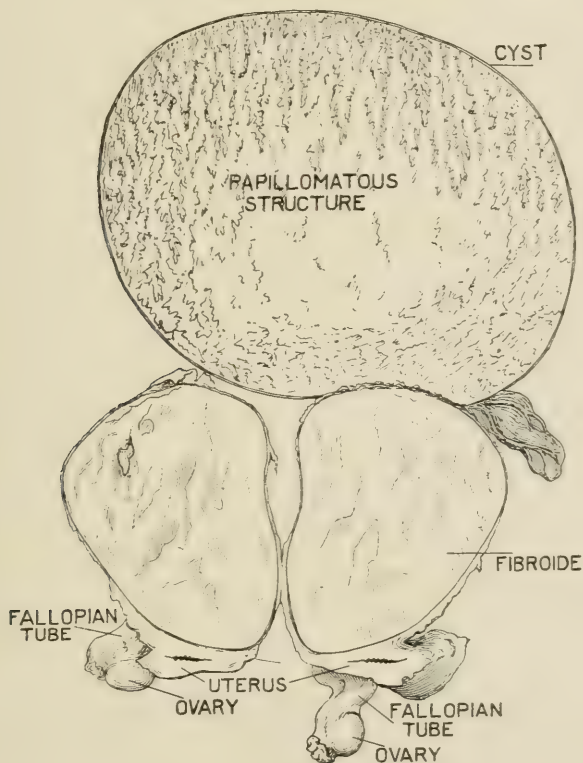
DR. YOUNG.—My preference is for the abdominal route in hysterectomy for many reasons, and it certainly has proved better in my experience. In this case I think perhaps I did take a risk in operating without a positive diagnosis. I did not have a freezing microtome, and did not have any one to make an immediate section, but the examination findings, history of the woman, menstrual history, the character of the diagnosis, and age taken together, justified the operation so far as the abdominal

section was concerned, and when I felt the uterus panhysterectomy was the only rational procedure.

H. J. BOLDT presented a specimen:

UTERUS WITH LARGE SUBSEROUS MYOFIBROMA WITH PAPILLARY CYSTOMA OF UNCERTAIN ORIGIN AND BILATERAL HEMATOSALPINX; PANHYSTERECTOMY.

The specimen is particularly interesting because of the uncertainty of the origin of the papillary cyst which is found to be in connection with the summit of the fibromyoma. That it is an



integral part of the tumor is obvious when one closely examines the specimen; yet to consider it to be a cystic degeneration of the fibroid, as is suggested in the pathologist's report, does not seem probable because of the papillomatous interior of the cystoma. Were the tumor of ovarian origin as was originally surmised by me, ovarian stroma would have been found in the walls of the tumor; moreover, the ovaries would not have been found practically normal and in their normal site in relation with the uterus.

The pathologist's report states the size of the cystic growth to be about 21 cm.; *in situ* it extended almost up to the diaphragm, and was, with the fluid within the tumor, nearly double the size mentioned in the report. The adhesions to the tumor, intestinal and parietal, were firm and extensive. The complete removal presented many technical difficulties. Before operation it was thought that the woman had a malignant tumor and the operation was undertaken more as an exploratory measure, believing that it would be necessary to again close the abdomen without removal of the tumor. The woman made an uninterrupted recovery and left the hospital, with my original binder still in place, on the tenth day. The bandage was not removed until after the expiration of three weeks. The plaster binder applied at the termination of abdominal sections is never removed by me until at the expiration of three or four weeks, unless some indication arises to inspect the wound before that time.

PATHOLOGIST'S REPORT. NO. 4338.

Uterus, tubes, and ovaries. Outlines of uterus not demonstrable. Tumor measures 17 x 15 cm. Attached to tumor is a cystic growth about 21 cm. in diameter. The tubes are distended at their distal extremities, the left considerably more than the right. Ovaries slightly enlarged, presenting small cystic formation.

On section, the large tumor is of firm consistency and cuts with difficulty. The entire tumor is circumscribed by a capsule of dense fibrous tissue, and is firmly attached to the muscular layer of the uterus. The cystic growth contains a large quantity of thick yellow fluid. Its inner surface presents many papillomatous excrescences and is unilocular. The tubes contain moderate amount of blood (hematosalpinx). Ovaries show numerous small cysts.

Microscopically, the large tumor consists of many smooth muscle fibers interlaced with fibrous tissue. There are only a few blood-vessels present. The capsule is composed of dense fibers of connective tissue.

Microscopic examination of the cyst wall shows the papillary outgrowths covered with stratified squamous epithelium and with a fibrous connective-tissue framework.

The connective-tissue stroma of the ovary is somewhat denser than normal. There are a very great many minute and larger vessels throughout the stroma whose walls are very thin; in many places no walls can be made out and there appear to be minute hemorrhages. Several cysts are full of blood. All these vessels are engorged with blood. There are many Graafian follicles present. Corpora lutei and considerable colloid material can be seen. One of the cysts is lined by an epithelial layer but no infiltration of the epithelial cells noted.

The walls of the Fallopian tubes are greatly thinned and the

mucosa correspondingly thinned. The walls are infiltrated with blood cells and there is some necrosis of tissue present.

Diagnosis.—Subserous fibromyoma, papillary cystoma, and double hematosalpinx.

REPORT OF REEXAMINATION A WEEK LATER.

Subsequent examination fails to show any connection between the cystic tumor and the ovaries. The exact origin of the cysts is uncertain. It may be a cystic degeneration of the fibroma.

DR. WELLS.—I should say that this was a fibrocyst of the uterus. It has been my fortune to operate on several tumors that were undoubted fibrocysts of the uterus where the interior had the same coarse appearance as this.

DR. BOLDT.—The report of the pathologist does not throw any light on it.

DR. JANVRIN.—Some thirty-five years ago I operated on a patient in Astoria, removing the uterus with an immense fibroid cyst growing from the fundus. The specimen was very carefully examined after the operation and pronounced by the pathologist to be a fibroid cyst. It corresponded absolutely with this case of Dr. Boldt's and with Dr. Wells' case.

DR. CRAGIN.—I now have a patient in the hospital from whom I removed one which seems to correspond with this in the coarse appearance of the lining. I have not yet had the pathologist's report.

The subject for the evening was

CARCINOMA OF THE UTERUS. DUTY OF THE PROFESSION AND THIS SOCIETY TO THE PUBLIC.

Papers were read by Dr. Isaac Levin,* Dr. Wm. S. Stone,† and Dr. Eugene Coleman Savidge.‡

DISCUSSION.

DR. MACCALLUM.—The discussion of carcinoma of the female genital tract interests me especially from the point of view of its relation to cancer in general, and to-night's interest seems to center largely in its relation to traumatism. Although the idea that traumatism might give rise to tumor growth was attacked vigorously by Cohnheim, we do not seem able to disregard it completely, and there are numerous examples of the development of a tumor on the basis of repeated irritation in which it seems hardly possible to escape from admitting this association.

It is generally accepted that the kind of traumatism that is

*See original article, page 201.

†Will appear in September.

‡See original article, page 214.

supposed to bring about cancers is different from that associated with sarcoma, but of all examples brought forward I do not think that we have any absolute proof in a single one that the traumatism is directly responsible for the growth. Doubtless it may predispose to it, but I think that Cohnheim has much evidence on his side when he says that statistics fail to show that these irritants are the direct cause of the growth.

Attention has been directed to the traumatism which occurs in the body of the uterus during childbirth and menstruation which, indeed, seems to constitute a more frequently repeated disruption of tissue and cause of irritation than is the case in the laceration of the cervix. It seems remarkable that no stress has been laid upon this as a possible cause of cancer since so great importance is ascribed to the rôle played by laceration of the cervix.

Those who hold to the opinion that injuries are causative factors in cancer growth may argue that in the Indian women childbirth is far easier than in white women since it is not affected so much by pelvic deformities and for other reasons, and hence the lack of injuries and rarity of cancer.

I wish to make a special appeal for your assistance in Dr. Levin's work which seems to me very important and in which he must depend on you for information. The aid really consists in the more minute answering of questions regarding the clinical data on which the building up of these statistics depends.

DR. STUDDIFORD.—It seems to me two points have been brought up to-night which have a more immediate bearing on the discussion: First, the necessity for early diagnosis, and, second, the necessity for educating not only the public but the general practitioner as to what he shall look for in making an early diagnosis. The need for this is shown by the deaths from carcinoma of the female genital organs.

In the greater city of New York for the last three years there have been 1,594 deaths from carcinoma, and in looking over those death certificates the great bulk of them are carcinoma of the uterus. A few other cases of carcinoma of other organs can be neglected. In 1907 there were 494 deaths; in 1908, 543; in 1909, 557. I think it is fair to assume that there are probably now in the city of New York somewhere between 1,500 and 2,000 cases of carcinoma in existence. Now when you figure up the number of cases that come to operation, it is a very small proportion.

Going over a few of the hospital records I have not been able—for it is rather a difficult matter—to get a tabulation of all the hospitals, but I doubt if there are 300 cases operated on for radical removal in the city in the course of the year out of a possible 2,000 cases. Of those cases of carcinoma, 1,342, a very large percentage of the deaths occur between thirty-five and sixty-five years of age, and this out of an estimated population of probably 600,000 women between those ages, so that it makes almost one

death in a thousand women between the ages of thirty-five and sixty-five, and probably four cases of carcinoma to a thousand.

Now how are we going to get at those cases earlier? That, it seems to me, is the question that is open for discussion, the question of early diagnosis, educating the women themselves up to the symptoms that are to be looked for, that are possibly indicating the development of carcinoma. Dr. Stone has suggested the examination for a woman after she has reached thirty-five, until you are sure that the irritation lacerations of the cervix, etc., are not the source of a developing carcinoma. Also the question of intermittent hemorrhages that occur when the woman approaches the menopause. These hemorrhages are too often looked upon as simply part of the menopause. Very frequently the general practitioner, the family physician, performs curettage. They do not come to the specialist for curettage, it is frequently done by the family physician. Unfortunately, in probably the great majority of these cases, the results of the curettage, the scrapings, are not sent to the skilled pathologist for examination, and it seems to me that it would be a wise thing that these laboratories that are investigating carcinoma let it be known that free of charge they would examine scrapings of any case of carcinoma, provided a history, such as they wanted for their records, would be forthcoming with the specimen.

In this way, undoubtedly, many cases of carcinoma would be found early, and undoubtedly many lives could be saved in that way. But at the present time all of our cases, or the vast majority of them, come too late for radical cure, and I think the suggestion that a committee from this Society be appointed to work out details as to how the general practitioner and public can receive more light on the subject is a good one.

DR. DICKINSON.—I ask Dr. Polak if from his forcible presentation of this matter, some years ago, urging that the practitioner should send his cases early for examination and diagnosis, he has seen any special result.

DR. POLAK.—I have not seen any results. The cases come to us just as late. The patient is treated by the general practitioner until she becomes impatient, seeks other advice and gets into the hands of some gynecologist who recommends a curettage for examination of the scrapings. There has been no response at all to the effort I made some years ago in that direction. Our operable cases are getting fewer and fewer. Operable in the sense that we can cure them by radical procedure.

DR. DICKINSON.—The Chair would like to summarize some of the practical points of this discussion. Dr. Levin urges fuller histories to aid the laboratory in deciding upon what points are of weight in etiology. His blanks have reached most of us, his investigators have tried to follow up our hospital histories, but I understand these are so meager as to give very little assistance. I would like to put this question to the members. Is it

possible to ask the cancer patient a large number of questions which the blank calls for and without telling her she has cancer, and so cause some cases to feel they have a hopeless disease? I have found that difficulty in some sensitive women. The second question is, do patients seek relief any earlier now than formerly? Have we succeeded in stirring up the general practitioner? Next, shall we try to interest the public? Shall we try to carry out on the cancer question the same kind of public education that has been attempted in the matter of tuberculosis? Shall we follow the German methods? Shall we circularize the profession and the public? Shall such matters be started by this Society? If the Chair appoints a committee, I am sure that it will want to get as many expressions from the members of the Society here to-night as possible. Will you express your views on these practical points, confining yourselves to these points?

DR. BOLDT.—The Chairman spoke a point with regard to the propaganda that has been made by the profession toward inducing the public to become acquainted with the subject of carcinoma, particularly of the uterus. The profession in this country has made no propaganda at any time. They have talked about it in their societies. They talked about it and of the importance of persons being examined, but no methodical method to do this has been brought about, in the way that Georg Winter did it and some others of our European confrères. This has not been done here at any time. I brought this question up before the American Medical Association a year ago. I asked them to appoint a committee for this purpose to devise some plan how to prevent the too late recognition of cancer. In other words to prevent the patients coming too late under the observation of a physician. The matter, I believe, has been buried, the same as a great many other matters have been buried by the medical profession.

There is only one way we can expect to do something, that is, go directly to the laity. It is not for me, nor for any one single member, to say we must do this or that, but a committee which has for its object the best interests of the public in general, and in particular woman, ought to find some ethical manner of getting this matter before the public. Whether the German method is the correct one or not I am not in a position to say. It is certain that from the efforts that have been carried out in certain districts in Germany that in those localities there are a greater number of operable uterine cancers than formerly. We must, furthermore, bear in mind that there is no one symptom that is characteristic of malignant disease of the uterus, and if we tell a woman that there is one such symptom it is a mistake on our part. We must teach the women that on the very first symptom that is *suspicious*, for them to consult their physician, and their family physician should then, if he is not in position to make a positive diagnosis, consult some one who can help him.

Dr. Stone brought up the question with regard to lacerations of the cervix. He believed that Dr. Emmett was correct in his statements when he said lacerations of the cervix were the cause of cancer. During my entire experience I only recall one instance where cancer arose from the site of a lacerated cervix. Whether this Society alone is in position to do much with the public unless we combine with other societies with our whole heart and soul I cannot say.

The title of the paper of the evening, as given in our program, suggests most important ethical questions which have been more or less carefully considered. So important do I consider this momentous question of "duty" that I feel obliged to limit the expression of my personal views to a very brief written statement. I submit:

Carcinoma of the uterus is, in the *majority of cases, incurable*. In order to hold out any hope of cure either to ourselves, or to our patients and their friends, we must be sure that the disease is limited to the uterus itself—that it has not to any degree invaded the lymphatics and other structures of the pelvis.

Early extirpation of the disease, therefore, at a period when we have good reason to hope that we may be able to remove *all* tissues which are the direct host of the neoplasm, such *early* extirpation, I say, is the only one that can give reason for a favorable prognosis.

Operations done in cases where carcinoma has invaded other pelvic tissues apart from the original development of the disease in the uterus are, at best, palliative and *should be presented as such* to the friends of the patient. To operate in cases which are virtually incurable, at the same time representing to the profession, and more especially to the public, that the operation is expected to be curative in its proper sense, is to lay down a postulate which is not warranted by experience, and is therefore dangerous and defective.

Experience has abundantly shown that our profession has by many of its representatives manifested a laxness, a carelessness savoring of something akin to charlatanry in many, many instances of carcinoma by making loose statements to patients and their friends as to the possibility of curing cases which can only be alleviated. Let us draw the picture.

A patient is under the care of a reputable, conscientious surgeon who finds carcinomatous invasion of the broad ligaments as well as of the uterus. He sees fit to explain to the friends that at best he can only offer an attempt to give temporary relief by an operation of considerable severity and some danger.

The case falls into the hand of another surgeon of "good standing" who thinks and says that a radical operation is demanded, that it holds out reasonable hope of cure; thus far the difference of opinion might be considered entirely ethical. But when he goes farther—and he usually does go farther—and

states that, if he "could have seen it" at such and such a time (the time at which the first surgeon made his observations) he could with almost positiveness have effected a *cure*, he not only brings reproach upon his profession, does an incalculable harm to a brother practitioner, but stamps himself as one who is willing to take unfair advantage of others, and also disseminates distrust and unhappiness in the minds of the patient's friends,

Follow such a case to its usual termination. The patient is operated upon "successfully"—that is, she does not die directly as a consequence of the operation—but in shorter or longer period she succumbs to the ravages of a disease which has *long before* implanted its fatal standards upon tissues beyond the reach of the knife. The sad chapter does not end here. Those friends who survive have that canker of bitterness and remorse to follow them—the thought that the golden opportunity of safety had been sacrificed by the first surgeon whose inactivity lost all!

Who dares—if he be honest—to state that the condition of the patient three, four, or six months before he has seen a given case was such as to be free from the incurable spread of the disease?

By what right shall we thus prejudge, by our retractive, superior knowledge, the opinion of a brother surgeon?

Against this too common irregularity I wish to make an uncompromising protest; and my earnest appeal is made for an awakening of that high standard of *honor* which has been, and ought forever to be, the glory of our profession.

DR. BROOKS H. WELLS.—A short time ago I had the pleasure, in the hall of the Academy of Medicine, of addressing a lay audience of about 500 middle-aged women and I felt that the important thing to tell them was this: That while we do not have any accurate knowledge of the causes of the growth of cancer, we do know that in the beginning, the very beginning, it is a local disease, and that if the disease can be discovered in the very early stages and treated by radical surgery while it is still a local disease, it can be cured.

I also impressed on them two other points. One was that nearly half of the cancer that kills women comes either in the genital organs or in the breast, and that every woman the minute she notices any little lump or any dimpling in the skin of her breast, should go at once to a competent physician and be examined, and, when over forty years of age, she notices any change in her menstruation pointing toward an increased flow, or irregularity, or spotting between periods, she should go at once to a competent physician and submit to an examination. That examination should be thorough and, if necessary, include a curettage and microscopical examination of the scrapings.

Too often signs like this are accepted by the woman, and, I am sorry to have to say, by her physician also, as meaning merely "the change of life."

It is well understood that many conditions other than cancer may make her flow, but the point I wish to insist on is this, all irregular bleedings should as she grows older be looked on with suspicion until proved innocent. An examination that shows no cancer does no harm while the alternative of early diagnosis and comparative safety is inevitable death.

If we can impress on the mass of the profession and on the laity a recognition of the necessity of making an examination reaching beyond the eye and beyond the touch and including the curet and the microscope we will be doing much for the earlier diagnosis of cancer in women.

DR. LEVIN.—In answer to Dr. Stone, I wish to say that I have great respect and admiration for Dr. Emmett's work and his treatment of lacerations is of great importance in gynecology. but it hardly has any direct bearing on prevention of cancer.

Dr. MacCallum is perfectly correct in his statement that labor is most likely easier in the Indian than in the civilized woman, but just this relationship is due to the difference in the whole life of the two classes of women, and the continuous repeated injuries during the civilized life, whether it be a corset worn during menstruation, or the long hours of standing at work, all will probably be more of a causative factor in the subsequent formation of cancer than cervical laceration.

The time is too short to consider all the remarks of Dr. Savidge. I wish to make a statement only in regard to the reason why an implanted cancer grows more readily on a young animal while spontaneous cancer is considered to be a disease of advanced age. A transplantation of cancer in a rat means grafting of tissue, and it is the usual experience of surgeons that a skin graft takes with a great deal more difficulty in an old person. The fact that an old animal does not take readily to grafting of cancer does not mean that the old animal is not adaptable to cancer growth. It has been shown that an old animal that does not take an implantation of cancer may subsequently contract the disease spontaneously. A young animal takes easier the grafting of cancer on account of its better ability to produce connective tissue and circulation around the implanted piece of cancer.

In answer to the remarks of the President, I wish to say that all the questions on the cancer schedule could be asked without arousing the suspicions of the patient. The only question that might indicate the nature of his disease would be the one regarding the occurrence of cancer in the family of the patient, and this question may be readily omitted. The most important point in the collection of these statistics is that as much detail as possible be obtained. To illustrate the point by one instance, it is indicated by studies both in England and in this country that miners are apparently less subject to cancer than people in other occupations, but the matter could not be studied from our material, since a miner is usually classed as a laborer. The

promise was given by the surgeons of the state of Pennsylvania to change statistical data in this connection. The same attention to detail should obtain in the collection of all other data for this investigation.

In answer to Dr. Studdiford's remarks on the question of the education of the practitioners and the lay public as to the necessity of an early diagnosis, I wish to state that we have undertaken to furnish free examination of tissue for every practitioner in New York and vicinity and hope that they will on the other hand furnish us with accurate histories of the cases. The teaching of the public is a very complicated matter, and I am hardly in a position to express myself in regard to it at present.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

(Concluded from July.)

WHAT ARE THE END-RESULTS OF SURGERY OR SURGICAL OPERATIONS FOR THE RELIEF OF NEURASTHENIC CONDITIONS ASSOCIATED WITH THE VARIOUS VISCERAL PTOSSES? TO WHAT EXTENT DO THEY IMPROVE THE NEURASTHENIC STATE ITSELF?

The American Gynecological Society and the American Surgical Association devoted one entire session to the discussion of this subject.

The discussion was opened by DR. REYNOLDS, of Boston, who spoke for the American Gynecological Society.

THE ETIOLOGY OF PTOSSES AND THEIR RELATION TO NEURASTHENIA.

DR. EDWARD REYNOLDS, of Boston, stated that the many technical questions connected with the operative management of ptosis had been a prominent subject of discussion for many years, yet the discussion about the end-results was almost as active and as much a moot question as it was ten years ago. The whole history of surgical progress showed that the long persistence of such a technical question without satisfactory settlement always implied an unsettled pathology or etiology, and that such a technical controversy was usually brought to an end only by some advance in theoretical knowledge of the cause of the lesions, after which the decision about methods was usually prompt and easy. Thus the selection of the etiology of the ptoses as the subject of the opening paper in this discussion which promised the most far-reaching results, and that which had been least thoroughly carried out heretofore.

The ptoses were not primary lesions. They were, on the contrary, always secondary to some mechanical cause, either in the relaxation of the supports of the organ, or in the existence of some abnormal force which pulled or pushed it out of place. Ptoses due wholly to mere relaxation of the normal supports were always multiple, and associated with general constitutional muscular weakness, or more commonly rapid general loss of fat. Cases of this class seldom demanded or were improved by operative treatment. The abnormal forces which produced ptosis might be of either local or general origin. Those of general origin were usually rather predisposing than direct causes of ptosis and usually became active only when some particular accident or strain increased the abnormal force directed against some given organ.

For detailed discussion of observations supporting many of the statements made in this article upon the subject of the influence of the general static forces on ptosis the reader was referred to an article published by the writer in conjunction with Dr. R. W. Lovett in the *Journal of the American Medical Association*, March 26, 1910, vol. liv, pp. 1033-1043, since lack of space prevented their repetition here. A bibliography of other articles on the subject was also given.

Many abnormal alterations of attitude and balance in the erect posture were believed to so alter the intraabdominal pressures as to predispose toward ptosis, but as the subject was not yet fully worked out two attitudes only were here illustrated and treated as of assured importance.

1. The round-shouldered, hollowed-backed position as described in orthopedic literature. It was shown that during the gradual assumption of this posture the pressures in the upper abdomen were increased, and those of lower abdomen were decreased in correspondence. The necessary mechanical result was, of course, a predisposition to prolapse of the upper abdominal organs. The abnormally forward position of the lumbar vertebræ tended to impact of the intestines against the anterior pelvic wall and was regarded as a direct cause of retroversion and consequent descensus of the pelvic organs, as a result of the ptosis of the intestines.

2. An alteration of attitude consequent upon conpubertal, developmental peculiarities of the individual woman, which were described under the name of the overfeminine figure. The resulting distortion of attitude was regarded as especially productive of the pelvic ptoses.

It was recommended that in all cases of ptosis careful search for distortions of attitude should be instituted before any operative treatment was determined upon. In at least the two attitudes illustrated it was believed that the abnormal attitude should be treated by mechanical or gymnastic therapeutics either before or after the adoption of an operative treatment of any ptosis. It was stated that such treatment would occasion-

ally take the place of operative correction, and would much increase the percentage of its success, even when it was necessary.

In both the postures illustrated the fundamental factor in the abnormality was an unduly forward position of the entire center of gravity, the rectification of which led to the assumption of a more correct posture. A properly devised therapeutic corset was recommended as at once the most comfortable and the most generally effective device for the accomplishment of this purpose, especially if associated with properly constructed shoes.

The local causes of ptosis were then taken up and were classified into increase of weight from neoplasms, inflammatory lesions, trauma, and developmental anomalies. Since the local conditions affecting the condition of viscera of the upper abdomen had been less carefully worked out, then those which were peculiar to the pelvic viscera, only the latter conditions were undertaken in this article. The various lesions were discussed in connection with the modification of operative procedures which were advisable in each case.

In pelvic ptosis due to obstetric trauma the general predisposing influences were again considered of importance.

The inflammatory affections of the uterine adnexæ were treated both as in themselves frequently sufficient cause for the development of the displacement and also as sometimes the secondary result of displacements and ptoses originally the result of the other causes falling under any of the classes discussed.

Three prominent developmental anomalies were discussed in detail. Unduly high attachment of the rectum to the vagina and even to the posterior surface of the cervix might be a direct cause of retrodisplacement, and was easily remedied by separation of the two organs in the line of cleavage, and their union by transverse sutures at the first step was an operation.

Persistence of the iliolumbar (or lumboovarian) ligament; this structure was normal in the fetus, and was occasionally found in the adult when it made direct backward traction upon the uterus and initiated the movement of descent. In the lesser degrees of its persistence it might be effective, and yet not easily found without special search. When present it should be divided, as a preliminary to any method of operative correction of the displacement. Traction due to the upper attachment of this ligament might perhaps be occasionally responsible for ptosis of the kidney or ileum.

Anteflexion of the cervix was regarded as the most important and frequent of all the local causes predisposing to the retrodisplacements. It was described as a partial arrest of development, always associated with shortening of the anterior vaginal wall and uterovesical ligaments. These conditions effected a forward fixation of the cervix, which being much the most fixed portion of the uterus, necessarily initiated a backward movement of the fundus whenever the uterus as a whole straightened.

The effects of anesthesia and other clinical observations were quoted as tending to show that this was a frequent occurrence. This remedy was a vaginal division of the tissues anterior to the cervix as a preliminary to any operation for the correction of the retroversion, in all cases in which this cervical anomaly was found to be present.

The paper concluded with a section in which the relations between the ptoses and neurasthenia were considered.

The term neurasthenia was a loose expression which should be defined before it was discussed. The mere state of low resistance to the environment which was usually all that this term was intended to convey, in its use in surgical literature, might be due to many different causes. When this state was in whole, or in great part, the product of prolonged suffering of local origin, the relief of local conditions like the ptoses by surgical treatment usually led to improvement in general condition. In neurasthenia of other than local origin the effect of operations on local conditions was generally harmful.

DR. JOSEPH A. BLAKE, in opening the discussion for the American Surgical Association, said that patients suffering from visceral ptoses and neurasthenia should be divided into two classes. First, those in which ptosis of the organ or organs contributed to the neurasthenic state simply by the effect produced on the organs themselves. In this category we had displacements of the kidney, the uterus, the colon, the stomach, etc. The results of operations upon this class were dependent upon the degree in which the condition affected the neurasthenic state. In the second class of cases a vicious circle was established, and ptosis increased the neurasthenic state if it was not the underlying cause. Operations undertaken upon patients of this class must have in view the relief of the autointoxication, otherwise they would only be productive of harm. Partial or total exclusion of the colon was a rational procedure in certain cases and good results might be expected, but the greatest care should be exercised in the selection of cases for applying this operation.

DR. JOHN G. CLARK, of Philadelphia, said that embryologically we had a defective individual, as a rule, to deal with from the beginning, and as the result of this defect we could not hope for the same surgical results as we would get from operating on patients with acute disease. The individual perhaps had had autointoxication from the beginning, and therefore a bad surgical subject for immediate or ultimate results, and it was particularly in this class of cases where surgeons should make haste slowly. In the last five or ten years he had tried various types of suspension operations in visceral ptoses, such as the Coffey or the Beyea type of operation, and had not had more than 75 per cent. of functional relief after following these cases carefully. In those cases in which there was a structural defect, as shown by obstructive and retention symptoms, one did not hope to get more than 50 per cent. of functional relief.

DR. MAURICE H. RICHARDSON, of Boston, said he approached the treatment of the neurasthenic for whatever cause, whether a definite, unmistakable pathological lesion, or a ptosis, or a slight lesion, like a displacement of the kidney, with the utmost discouragement. One of his recent cases was a woman whose abdomen was covered with scars from repeated operations that had been performed without relief, her last state being worse than the first. Finally, it was found that this woman's gall-bladder was full of gall-stones, which were removed, followed by relief.

As to enteroptosis and operations for large dilatations of the intestine, he could recall examples of cases in which he was driven to operation after these patients had gone to the neurologist, the gynecologist, the general surgeon, and had been treated by them without relief, but with the same general results of discouragement. In one instance, eight or ten years ago, he resected the large intestine two or three times with the hope of affording relief, but the patient was in the same neurasthenic condition as in the first place. In addition to the operation on the intestine she had developed a large ovarian cyst, which was removed.

Before operating on these cases we should, first, be sure that there was a lesion. Second, that it was the chief cause of the neurasthenia. Third, we should see if it could not be cured without operation; but if operation was to be done, we should see to it that it did not subject the patient to too great a danger. He believed that neurasthenia was more of a disease than we gave it credit for; that it was some central, organic, or nervous condition on which operative surgery would have about as much effect as the surgical treatment of epilepsy.

DR. RICHARD R. SMITH, of Grand Rapids, Michigan, restricted his remarks to a general consideration of the etiological factors to be thought of in connection with visceral prolapse and accompanying neurasthenia in women who presented themselves to the gynecologist for the relief of symptoms.

DR. LEWIS S. McMURTRY, of Louisville, Kentucky, asked how often, after difficult manipulations in the abdomen in normal individuals, did we leave in the haste of an operation the viscera disposed in every possible irregular manner, and yet these things corrected themselves in normal persons, and they necessarily had no connection with neurasthenia, so that more evidence was needed than we had at the present time to show that visceral ptoses were the principal factors in the production of this condition of the nervous system and metabolism of the body known as neurasthenia, and he thought that the error in our procedures had been in assuming that these visceral ptoses were in all cases the cause of the neurasthenia.

As to the clinical side of the subject, his experience was like that which had been related by other surgeons. Operative procedures for all these ptoses, whether of the pelvic organs, the

kidney, or the alimentary tract, had been unsatisfactory. Neurasthenia occurred in both sexes in all stations and all conditions of life, among the rich and the poor, and its exact nature or its pathology was as yet unknown, and until it was more definitely known the results were going to be as we saw them reported to the profession at the present time. What they needed was a definite statement as to the origin or cause of this condition which they knew as neurasthenia.

DR. WILLIAM M. POLK, of New York, said that in patients who presented themselves with ptoses that had been described as belonging to the upper abdominal cavity, they had conditions that unquestionably they balked before, but here he was convinced that orthopedics furnished a most efficient aid, and the lines laid down by Dr. Reynolds and by Dr. Lovett, of Boston, who had been associated with him, would be the means of benefiting very many of the conditions at the present time for which surgery had been considered the only means of relief. But the psychoneurologist should not be forgotten in connection with these cases. There was no reason why they as gynecologists and surgeons should bear all the burden in these cases. He had long since come to the conclusion that there was a conspiracy on the part of the neurologist to land on them a class of cases which he knew full well would test every particle of his acumen, and here was a brilliant opportunity for the psychoneurologist to exploit himself to the fullest extent. When these neurasthenics came to you you should say to these patients: First pass through the hands of a competent orthopedist; pass next through the hands of a conscientious self-doubting neurologist, but beware of the overconfident neurologist. Then you could say, madam or sir, as the case might be, as you have now reached the end of all things, so far as medical investigation is concerned, I am now more than willing to command all the resources of my refinement of the surgical art.

DR. A. J. OCHSNER, Chicago, said he wished to subscribe to the axiomatic statements made by Dr. Blake in regard to the surgical treatment of this class of cases. There was no doubt but what the condition of neurasthenia could be greatly exaggerated or possibly caused by the result of enteroptosis, when these results produced obstruction either to the alimentary canal and interfered with nutrition and caused autointoxication or when the condition gave rise to obstruction of the ureter or caused an accumulation of mucus in the gall-bladder, and secondarily caused gall-stones. The relief, after an operation on such cases, even though the neurasthenia was possibly caused by this condition, must be in most cases exceedingly unsatisfactory, and due to two causes. First, we did not mechanically relieve the condition, no matter how perfect the operation might be, except in a few instances, as, for instance, in draining and suspending the gall-bladder in removing a hydronephrotic kidney.

Dr. Reynolds' presentation was along the line of observations

he had made and which caused him to suggest prophylaxis rather than treatment in this way: many years ago, in studying the treatment of hernia in children, he found that hernias in children were cured spontaneously, provided conditions were secured in which there was absence of abnormal intraabdominal pressure and traction by placing these children in a position with the foot of the bed elevated at from fifteen to thirty degrees. He found that in these children with pendulous bellies the recti muscles came together if they were shortened, that the oblique muscles were strengthened, and that the intestines, instead of hanging at the bottom of the pelvis, would, after a few months' treatment, be in normal position. He found that this enteroptosis in children had resulted from improper feeding, from gaseous distention, and from other sources of abnormal intraabdominal pressure. In some of the cases the increased abdominal pressure was due to severe straining from constipation, and with the relief of this the enteroptosis in children was decreased to a very marked extent. He believed by overcoming the causes of enteroptosis in children they would prevent its occurrence in many adults.

DR. HOWARD A. KELLY, of Baltimore, said he was convinced from the conclusive demonstration of Dr. Clark, Dr. Richardson, and Dr. Lovett that they had found the key to some of the underlying causes of these conditions and that rational therapy was to be adopted on such general and orthopedic lines as they had outlined. He had been asked to speak upon nephroptosis, and he would restrict his remarks to the various types of nervous systems associated with movable kidney.

Movable kidney was frequently found in neurasthenics. Movable kidney, associated with renal pain, might exist to such a marked extent as to bring on the neurasthenic state. The symptoms connected with movable kidney sufficient to justify operative procedure, were, as a rule, definite and of a local mechanical nature. Psychotherapy was of little use as an adjuvant in treating neurasthenics and in relieving either local or general ptoses so long as a displacement of the kidney persisted. On the other hand, psychotherapy and other forms of treatment which aimed at building up the patient's general condition might seemingly effect a cure. In an analysis of 245 cases of nephroptosis, seventy-eight or 31.4 per cent., had neurasthenia of varying degrees. Personally, he never operated on neurasthenic patients without definite local symptoms.

DR. WILLIS G. MACDONALD, of Albany, stated that not all patients who suffered from ptoses were neurasthenic. A very large proportion of them did not present symptoms. In a large number of these cases of neurasthenia associated with ptoses the responsible conditions were autointoxication from the intestinal tube and peripheral irritations from movable organs. He divided patients suffering from neurasthenia and ptoses into two classes. In the first class they had those patients who

traveled from rest cure to rest cure, from one climate to another, and who were pretty generally battle-scarred from their conflict with surgery. For this class surgery had no potency. There was no hope for relief from surgical intervention in such cases. On the other hand, there was a considerable group of cases in which the condition could be traced to an overloaded cecum and sigmoid—a constant filling of the intestinal tube, with a large, dilated myasthenic stomach lying upon the symphysis pubis. Operation would relieve successfully a large number of such patients; yet unfortunately their clinical methods were not sufficient to determine always just which cases would be favorably influenced by surgical intervention and those which would not, and in making statements to physicians and friends of such patients they should, as a matter of common honesty, express some doubt as to the ultimate results in this particular class of cases.

DR. JOHN K. MITCHELL, of Philadelphia, said that the whole causation of neurasthenia seemed to be bound up in a kind of vicious circle where one symptom produced another until one positively could not disentangle the chain. What did they know about the normal relations of the abdominal organs? What did they know about the position in which the various organs in the belly ought to be in ordinary upright posture which they maintained a large part of the time? How much mobility should such organs as the kidney and liver have? Apparently, from the manner in which the intestines were distributed in the belly, they were not placed there like articles on a shelf to be maintained in one position, but they possessed a certain amount of give and take. He saw very few neurasthenics in which the kidney did not have more or less play, and slightly movable kidneys sometimes gave worse symptoms and caused more trouble than freely movable ones, and a floating kidney, unless it resulted in a twisting of the ureter and stoppage in that way, causing pain in the ureter and in other portions of that neighborhood, did not produce so much symptoms as the kidney that was only slightly movable, one in which it would be difficult for them to determine whether it was movable or not. Before operating on a neurasthenic patient, the surgeon should have a definite idea as to whether a pathological condition existed or not, what he was going to do, and what he hoped to accomplish by the operation, otherwise the results from surgical intervention would be unsatisfactory.

DR. WILLIAM J. MAYO, of Rochester, Minnesota, said he agreed with Dr. Clark that the patients they had under discussion were wrong from the beginning, and his own feeling was that but a small number of them should be treated surgically. For some years they had made a careful examination of all patients who presented themselves, no matter whether they had cancer of the breast or gall-stones or what not, and to their surprise they

found that about 25 per cent. of the women had retroposition of the uterus. They did not find that retroposition of the uterus was more frequent in the latter decades of life. Even young girls who came to them, in whom pelvic examinations were made through the rectum, had retroversion of the uterus in about the same proportion of cases as those women who had reached the menopause. Again, they found 20 per cent. of the patients who came to them had movable kidney, and a very large majority of them did not have any symptoms whatever. He thought the neurasthenics, from a surgical standpoint, should be treated like the insane, in that they should take no cognizance whatever of their general complaints, but if they had sufficient local pathology to warrant operation they should operate on them, as they had no right to deny them the relief that came from surgery. Doubtless many of these patients would be benefited by the Emmanuel movement or by Christian science, and many of them would gladly turn them over to a Christian scientist if they were convinced that the Christian scientists were really Christians, because it really took a Christian to handle them.

ON FIBROMYOMATA OF THE UTERUS, WITH SPECIAL REFERENCE TO
ABDOMINAL HYSTERECTOMY: A REPORT OF TWO HUNDRED
AND FIFTY SUPRAVAGINAL HYSTERECTOMIES.

DR. I. S. STONE, of Washington, D. C., read a paper on this subject, which will be published in this JOURNAL.

TOTAL ABSENCE OF THE VAGINA AND OF THE UTERUS; RIGHT
PELVIC KIDNEY; ABSENCE OF THE LEFT KIDNEY; THE TUBES
AND OVARIES ON BOTH SIDES IN THE INGUINAL CANAL.

DR. THOMAS S. CULLEN, of Baltimore, gave the clinical history of a patient, aged seventeen, white, who came complaining that she had never had her menstrual periods. On examination he found total absence of the vagina, but by rectal examination was able to detect a mass filling the right half of the pelvis. This mass he thought might be the uterus with retained menstrual flow. An incision was made between the bladder and rectum until the mass was reached. It was, however, found to be hard. The abdomen was at once opened and filling the right half of the pelvis was a somewhat irregular mass. This on its inner aspect had a definite cleft which suggested the pelvis of a kidney. A hand was carried up into the right renal pocket, but no kidney was present at that point. Examination of the left side failed to reveal any left kidney. He was dealing with a right pelvic kidney. There was no uterus. Half of the right tube emerged from the inguinal canal. The remaining portion of the tube and the corresponding ovary lay in the inguinal canal. A small loop of round ligament was seen emerging from the inguinal canal. On the left side the tube and ovary could not be seen, but could

be felt in the inguinal ring. A small portion of the round ligament was discernible.

He briefly discussed the relative merits of Baldwin's operation where a vagina was made from a portion of the intestinal tract and Ferguson's operation where a new vagina was made by turning in skin flaps.

Dr. Cullen demonstrated a specimen of

ADENOCARCINOMA OF THE FALLOPIAN TUBE

coming from a patient forty-six years of age. The chief interest in this tube lay in its immense size. It formed a tumor 14 x 12 x 10 cm. Near the uterus the tube was normal in size. After it had passed out 5 cm., it was 5 cm. in diameter and its outer and occluded end was 10 cm. in diameter. The great distention of the outer end of the tube was in part due to an accompanying hydrosalpinx. The growth was limited almost entirely to the inner surface of the tube. It was of a distinct papillary variety. The left tube was also involved in the carcinomatous process. Cullen said that this was one of the largest carcinomata on record.

THE REPAIR OF INACCESSIBLE VESICOVAGINAL FISTULÆ FOLLOWING HYSTERECTOMY; REPORT OF TWO CASES.

DR. GEORGE GRAY WARD, JR., of New York, read this paper.

THE INFLUENCE OF THE TRENDLENBURG POSITION ON THE QUANTITY OF URINE EXCRETED DURING ANESTHESIA.

DR. J. WESLEY BOVEE, of Washington, D. C., stated that at the meeting of this Society last year he presented a report of investigations made in his clinic in Columbus Hospital for Women regarding the influence on renal activity from anesthesia by ether and by chloroform during surgical operations. He had not then thoroughly studied the variation due to the Trendelenburg position, but recorded his having been greatly impressed by it. Eight cases were therein noted as illustrative, and five cases had been especially studied. Having recently studied eight cases of ether anesthesia and eight of chloroform, he now offered his report on those observations. He believed that the results demonstrated that almost no urine was received in the bladder while the Trendelenburg position was being employed.

He described the technic adopted, and said that in some of the cases it would be noted that following the operation no urine was excreted during the hour and a quarter subsequent to the end of the operation. In each instance, at the end of twenty-four hours, the quantity and quality were practically normal. In the chloroform series two patients excreted unusually large quantities during the early part of the anesthetic, one 144 c.c.

in thirty-five minutes, and the other 168 c.c. in thirty-six minutes. These two cases increased extravagantly the average amount for fifteen minutes to 22 c.c., which was greatly in excess of the average (8.2) for the other six cases of the series.

In the paper of last year he mentioned the marked lowering of the rate of urinary flow in the Trendelenburg position, estimating it at 32 per cent. In the series now submitted the decrease was for ether 58 per cent. and for chloroform 93 per cent. The decrease in the chloroform series was very much exaggerated, though in the six cases of the series in which the flow before using the Trendelenburg position was about normal, the decrease was 82 per cent. It might be said, therefore, that while the patient was in the Trendelenburg position the percentage of decrease in the excretion of urine was 58 per cent. in the ether anesthesia and 82 per cent. in anesthesia by chloroform. That this great decrease was not even in moderate degree due to urine being retained in the renal pelvis was clear, for the rate of flow subsequent to the changing of the patient to the horizontal was not suddenly greatly increased, being but slightly increased in the ether series, a little more in the chloroform series, and not for an hour and a quarter reaching a rate in excess of that of the period preceding the use of the Trendelenburg position. Nor could it be said that the bladder was not satisfactorily drained by the catheter, inasmuch as the fluctuations were always gradual and never sudden except when changing to or from the Trendelenburg position.

If it could be concluded that the renal function was greatly lessened while the patient was in the Trendelenburg position, then the dangers of that position were at once appreciated. In renal inefficiency, cardiac and arterial lesions it would seem the use of the Trendelenburg position would introduce a special element of danger and this more marked when ether was used than when chloroform was employed as the anesthetic.

THE POSTOPERATIVE TREATMENT OF ABDOMINAL SECTION FOR
PELVIC DISEASE, WITH SPECIAL REFERENCE TO EARLY RISING
AND THE USE OF ESERINE.*

DR. BROOKS H. WELLS, of New York City.

CESAREAN SECTION FOR IMPASSABLE CONTRACTION RING.

DR. ROBERT L. DICKINSON, of Brooklyn, New York, contributed a paper on this subject. He said that, apart from consideration of contracted pelvis or relative disproportion between passage and passenger or blockade by scars or tumors, section for impassable contraction ring was warranted when the following conditions were present:

1. Child living and not definitely enfeebled or endangered by length of labor or unskilled attempts at extraction.

* See original article, page 229.

2. Ring refusing to relax under morphia or complete anesthesia, and to yield to patient manual dilatation by a skilled obstetrician.

3. Mother in fair condition for a laparotomy and not infected.

4. Request by patient and husband that a somewhat increased risk to the mother be assumed for the sake of obtaining a living child in lieu of embryotomy. These indications were perfected if (5) at a previous labor, in expert hands, this same condition of the contraction ring had caused loss of a child not unduly large. This held good whether the ring was in advance of the head or about the neck.

The association of a rigid ring with other reasons for section was frequently present.

The following case seemed to be the first instance of deliberate section for the indication—rigid ring in advance of the head. Dr. Watt's cases appeared to be the earliest for neck constriction, and these three the first classical Cesarean sections for contraction ring blockade.

A healthy woman of twenty-six was delivered at the thirty-second week with forceps. The obstruction ring did not relax under chloroform and the death of the child was due to the amount of traction necessitated. Two years later, at the thirty-fifth week, she fell into labor in his care. A thumb-thick circle admitting two fingers lay just above the plane of the pelvic brim. Morphia did not help except to rest the patient. Attempts at dilatation under anesthesia failed. The ring retained its contraction after the emptying of the uterus. Both patients did well.

The literature showed five cases, all hysterectomies, two after failure of embryotomy, only one, that of Sinnetamby, for transverse presentation being undertaken for the indication with a living child.

The paper fully summarized the literature on the whole subject of the retraction ring since 1899, when it was fully covered in Cheron's book.

REPORT OF THE COMMITTEE OF THE AMERICAN GYNECOLOGICAL SOCIETY ON THE PRESENT STATUS OF OBSTETRICAL EDUCATION IN EUROPE AND AMERICA, AND ON RECOMMENDATIONS FOR THE IMPROVEMENT OF OBSTETRICAL TEACHING IN AMERICA.*

OFFICERS.

The following officers were elected for the ensuing year: *President*, DR. REUBEN PETERSON, Ann Arbor, Mich.; *Vice-Presidents*, DR. JOHN F. THOMPSON, Portland, Me., DR. JOHN G. CLARK, Philadelphia, Pa.; *Treasurer*, DR. J. WESLEY BOVEE, Washington, D. C.; *Secretary*, DR. LEROY BROWN, New York.

Atlantic City, New Jersey, was selected as the place for holding the next meeting.

*See article, page 259.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of January 21, 1910.

DR. J. WYETH COOK *in the Chair.*

DR. JOSEPH S. WALL read a paper on

THE COMPLICATIONS AND SEQUELÆ OF DIPHTHERIA.*

DISCUSSION.

DR. ACKER, in opening the discussion, said that as sequellæ of diphtheria there was a parenchymatous degeneration of all the organs of the body, kidney, heart, and nerves especially. Suppuration of the glands of the neck was not as common as considered by some. He had seen bronchopneumonia, but practically never croupous pneumonia. Paralyses were the most common sequel. Inflammation of the heart with enlargement was of frequent occurrence. One of his cases also had a thrombosis of the femoral vein. Another sequel was an anemia that might progress till the hemoglobin was but 40 per cent., which accounted for want of appetite and vomiting in certain cases. The maintenance of nutrition may be difficult on account of this vomiting. One case was complicated by myxedema. The child was still taking thyroid extract. Antitoxin did not prevent or diminish any of the complications yet it did no harm, except for the skin changes. As a rule, it was not given early enough or in doses large enough. He had one case of clinical diphtheria in which the hay bacillus overgrew the culture. Yet the case was given antitoxin and sent to the isolation hospital. He had never seen a case of joint involvement complicating diphtheria. In the treatment of the throat conditions he never allowed peroxide of hydrogen to be used. It reddened the throat and allowed the disease to spread.

DR. WHITE said that at the Willard Parker Hospital in the cases of scarlet fever diphtheria bacilli not infrequently showed in the throat cultures. There were also many cases of suppurating glands of the neck there. Scarlet fever often complicated diphtheria and *vice versa*. He thought that antitoxin did diminish the mortality and so must diminish the complications.

DR. ACKER said that he considered the kidney involvement as frequent as before the days of antitoxin and he found complica-

* See original article, page 350.

tions occurring even in the cases where antitoxin was used early and in large doses. The anemia and paralyses were also present just the same.

DR. BALLOCH asked what the effect on the complications would be when the antitoxin was given before the poison got into the blood.

DR. BOVEE asked whether the early application of iodine to the membranous area would cause antiseptic penetration into the tissues deep enough to control the disease.

DR. ACKER, in discussing the duration of prophylaxis following an immunizing dose of antitoxin, said that he had had one case develop two months later.

DR. MORGAN thought that his hospital cases had more frequent sequellæ than his cases in private practice. One case during convalescence had suddenly dropped dead. Paralyses were more frequent in adults than in children. He thought that the early use of antitoxin prevented complications. Albuminuria was present in 95 per cent. of the cases.

DR. BOVEE asked if there was a nonimmunity to diphtheria.

DR. DONNALLY asked how long it was necessary to keep patient in bed to prevent cardiac complications, as some authorities said five weeks.

DR. WALL, in closing, said he thought that complications occurred in spite of the early use of antitoxin. The Klebs-Loeffler bacillus might occur accidentally in scarlatina. Albuminuria was almost as frequently present as in yellow fever. Joint complications were rare and were not frequently mentioned in text-books. He did not believe in the local applications of iodine as it caused spread of the membrane. Immunity from prophylactic doses of serum was expected to last three weeks. Antitoxin must be used in large doses. Anaphylaxis was to be prevented by the use of large initial doses. Some patients had idiosyncrasies to the horse and were poisoned by the horse serum.

Meeting of February 18, 1910.

The President, DR. KELLEY, in the Chair.

DR. ADAMS read the essay of the evening on

TOLERANCE OF QUININE BY YOUNG CHILDREN WITH MALARIAL DISEASE.*

DISCUSSION.

DR. ACKER, in opening the discussion, said that the essayist was to be congratulated upon not getting any dangerous results from giving quinine in such large doses at such early stages. He

*See original article, page 359.

preferred to study his cases very carefully and then after the diagnosis of malaria had been made to start with small doses of quinine and gradually increase them. In one case he had given 5 grains every three hours for several days, but plasmodia had previously been found in the blood. In the baby he considered that inunctions was the most suitable method of administering the quinine, and then solutions in syrup of santa yerba or wild cherry with the addition of a little sulphuric acid. Many of the cases of malaria had a large spleen which helped to make a diagnosis.

DR. THOMAS believed in looking for an idiosyncrasy before giving such large doses of quinine. Many conditions simulated malaria in the child in the one symptom of the sudden variation of the temperature, and so the diagnosis in the child was more difficult than in the adult. In adults in the tropics doses of 90 to 100 grains of quinine a day were given in malarial cases.

DR. COOK thought that from the large doses of quinine given without physiological effect that the drug could not have been wholly absorbed.

DR. WALL said that in the tolerance exhibited in these cases was shown the safety with which large doses of quinine could be given when the effect was not gotten from the small doses. In the dispensary of the Children's Hospital blood examinations were made regularly, but in the cases clinically malaria, whether the plasmodium was found or not, quinine was given in small doses continuously without any regard to the time of the occurrence of the paroxysm.

DR. BALLOCH asked if any effect had been noted on the activity of the white blood cells in the cases where the quinine had been given in such large doses.

DR. ADAMS, in closing, said that the spleen was rarely enlarged in children. The diagnosis was made in his first case largely by exclusion. The blood examinations were disappointing even in the cases of clinically pure intermittent fever. Examinations were made in all stages, but none had shown plasmodia. As to absorption of the quinine, microscopic examination of the stool had been made and no quinine seen, but no chemical examination was made. In the cases where the Warburg's tincture was given the effect of the aloes was obtained, though no effect of the quinine was seen. He had never seen more than a deafness from the quinine and never an urticaria.

Meeting of March 18, 1911.

The President, DR. KELLEY, in the Chair.

DR. WHITE presented a specimen of skin demonstrating a method of skin closure. The method owes its origin to an unknown source.

Briefly stated, it consists in passing an ordinary through-and-

through interrupted suture to include the skin and subcutaneous tissue then returning with the same suture through the skin at the extreme edges of the wound. Both ends of the suture are on the same side of the incision, and the stitch may be said to resemble a vertical mattress suture. This technic gives perfect approximation of the edges, overlapping being impossible. They are as easily removed as the usual interrupted stitch.

I never expect to see a universal method of closing abdominal wounds, as every plain can be theoretically dissected, and so I expect many criticisms of an unfavorable nature upon this particular suture. To the surgeon who shudders at the thought of dormant staphylococci in the skin, stirred to a frenzy by the presence of a suture, this method is surgical anarchy. To those of us who are fearless, though ignorant, of such diabolical digressions in the behavior of bacteria, this suture may avail us something. I am sure of one thing, it gives perfect approximation. Six months' use of it has proven it to me. I have had no suppuration. Anent the question of suppuration, or stitch abscess, I have been impressed with the fact that the phenomenon rarely occurs before the sixth day. How soon do we usually find infection after a punctured wound? Sometimes within twenty-four hours and generally within three days. I believe there are two factors in the causation of this undesirable result: First, the tension of the sutures, producing a local anemia, and suppuration follows as a result of lessened local resistance, or what may be termed ischemic infection. Second, stitches that remain in the tissues may open an avenue for organisms from the surface. When a stitch is first introduced the tissues cling closely to it, but after a few days there is absorption immediately about it, just as there is about any foreign structure which exerts pressure, creating a sluice for organisms. As a prophylactic measure against stitch abscesses, the minimum tension with proper approximation and the early removal are recommended. I have found that pain is lessened if stitches are cut on one day and removed the next, probably because the elasticity of the tissues tend to make the path of the suture a straight one, hence less resistance in removal.

DR. BALLOCH asked if any special suture material was desirable in this method.

DR. STONE said that the careful approximation of the skin was desirable as the surgeon was judged by both physicians and friends from the appearance of the scar. The method described by Dr. White prevented pressure at the corners of the wound. The majority of infected wounds followed undue crushing of the tissues.

DR. MILLER said that this suture of Dr. White applied only to the skin closure and left the deep closure to absorbable suture material of any nature. Many cases of abdominal wound closure with deep absorbable sutures had been the cause of the wound breaking open, and hence he preferred a through-and-through

suture down to the peritoneum of silkworm gut which would assure the nonabsorption until the stitch was removed, and also prevent the accumulation of serum in the wound.

DR. WHITE said that silk or Pagenstecher linen was the choice for suture material. The care in the approximation of the skin edges saved the later dressings. He claimed no originality for the method.

DR. SOTHORON read the essay of the evening on

CARDIAC LESIONS IN PREGNANCY.*

DISCUSSION.

DR. SPRIGG, in opening the discussion, said that no complication of labor was worse than a severe cardiac lesion. He thought that in mitral stenosis pregnancy should always be terminated at the earliest possible date. Acute endocarditis developing during the pregnancy was rare. He had seen one such case in which a bruit developed in thirty-six to forty-eight hours and cleared up in six to eight days. In the chronic cases of endocarditis with compensation the patient frequently did well. He had had two cases of mitral stenosis with loss of compensation which he kept in bed for a long time. There had been no symptom of labor until the second stage; she was delivered, but died twelve minutes later. In the second case seen at Columbia Hospital with Dr. Lawson acute pulmonary edema developed during labor. The woman was delivered forcibly under anesthesia with separation of the symphysis. The mother recovered and is now well, but the baby died. In the normal labor the blood pressure is lowest in the second stage and the lowering of pressure is the dangerous factor in the labor. The patient should be anesthetized and artificially delivered, digitalis being given in the first stage. The question of marriage was important, but it could not be controlled by the medical profession.

DR. WALL asked if there had been made any studies in blood pressure during labor. The greatest danger was said to be after the third stage.

DR. FRY said that in 1880 he had had a case with Dr. W. W. Johnson. There had been no symptoms prior to labor when dyspnea and edema of the lungs suddenly developed. A forceps delivery was done and the patient got well. In all cases he considered it as important to watch the heart as well as the kidneys. If symptoms developed in the second half of pregnancy, all exercise should be avoided. No strain should be allowed in the second stage. There was no straining with the pains of the first stage, and the bearing-down strain of a second stage could be avoided by a quick forceps delivery under ether. Digitalis

* See original article, page 272.

should be given at the first stage to prevent the later low pressure in the blood-vessels. In aortic lesions it was the low pressure that increased the mortality. The mortality of all cardiopaths in labor was about 5 per cent. In his own thirty to forty cases he had had only one death and that was in a primipara with a severe heart lesion, so that she had not left her room for months. He was called to see her in labor and she dropped dead as he entered the room. The cervix was dilated and the child extracted with forceps, living eight or ten minutes after the death of the mother.

DR. MORAN said that he was in accord with the essayist as to the seriousness of all heart lesions in pregnancy.

DR. ACKER saw the first case with Dr. Sothoron. There was such slight compensation that the least exertion caused dyspnea. The result in that case had been excellent. He thought the action of digitalis too slow to be of any use when given during labor, and it should be given several days beforehand. During labor strychnine was needed. In the second case with hemiplegia it was a surprise that she lived as long as she did. Dr. Johnson had had the care of one case that went through five pregnancies, dying in the last.

DR. MORGAN considered heart disease a more common complication of pregnancy than was generally recognized, since the heart was not examined as routine by the average practitioner. He considered mitral stenosis the rarest and most fatal type, and mitral regurgitation not as serious. If it was first discovered late in pregnancy it was rarely fatal. After labor venous engorgement was to be feared, patients dying in a few hours.

DR. SPRIGG said that the cases with marked lesion and loss of compensation were always severe. He made a heart examination in each case with the examination of the urine and the pelvis. The blood pressure reached its maximum with the height of the labor pains and its minimum after the delivery of the fetus. In these cases he considered the placental removal should not be by expression but by scooping the placenta out with the hand so as to favor bleeding and keep the blood pressure more even.

DR. MILLER suggested that since it was not feasible to prevent the marriage of a cardiopath that perhaps it would be advisable to prevent the pregnancy dangers by removing the tubes prior to marriage.

DR. WALL said that he did not understand the therapy suggested by Dr. Sprigg of bleeding the woman whose danger lay in her low blood pressure.

DR. SPRIGG said that the bleeding was from the venous side of the circulation and lessened the chance of overdilatation of the heart muscle.

DR. THOMAS said that hemorrhage was good treatment in pulmonary edema and lesion of the right heart. It should be followed by caffeine and digitalin or strychnine by hypodermic. He thought that the cases of apparent mitral insufficiency that

developed during labor were probably not valve lesions, but muscle lesions with the murmur from the dilated wall making the valve insufficient. He considered the mitral lesions more serious than the aortic. The majority of heart lesions went through pregnancy without loss of compensation.

DR. SOTHORON, in closing, said that there were but few obstetricians that did not examine the heart. The question of opinion in these cases was on the definition of the term good compensation. He considered dyspnea as the danger signal in all the heart cases. In adipose cases he thought that early labor was indicated.

REVIEWS.

LEHRBUCH DER OPERATIVEN GEBURTSHILFE. VON PROF. DR. SIGFRID HAMMERSCHLAG, Berlin, Privatdozent an der Alberts-universität zu Königsberg i. Pr. Mit 191 Abbildungen. Leipzig, S. Hirzel. 1910.

This book is intended for students and practitioners and is based on the author's extensive experience as head of the obstetric clinic at Königsberg. The author reveals a fine pedagogic sense in the emphasis he places on those phases of the subject that interest particularly the inexperienced obstetrician and in an unusually clear presentation of the subject. While pathology, diagnosis, etiology, and symptomatology, are merely cursorily outlined, the indications, description of the operation, and the postoperative treatment are discussed in detail. The author pays especial attention to the precautions necessary, both before and after operation, and to the proper management of the difficult operative features. The author makes extensive use of statistics to elucidate his views. The illustrations form one of the most attractive features of the book. They are largely drawn from life, many of them are colored, and all are beautifully executed.

I. R.

LES GREFFES OVARIENNES. ENVISAGES AU POINT DE VUE DE LA PRATIQUE CHIRURGICALE. ETUDE CRITIQUE EXPERIMENTALE ET CLINIQUE. Par DR. LOUIS SAUVE, Prosecteur à la Faculté ancien Interne Lauréat des Hôpitaux. (Medaille d'or, 1907.) Paris, G. Heinheil, éditeur. Francs 3.50.

This small monograph is rather a critical and clinical review than an experimental study. The author justly emphasizes the notable lack of histological studies in the cases and experiments reported, as follows: 1. From the experimental point of view, the question of ovarian grafts has been well elucidated. The autoplasmic graft succeeds perfectly without a complicated technic, without the necessity of making a vascular anastomosis and no matter where the graft is made. The heteroplasmic

graft, on the contrary, has failed to take, in the great majority of the cases.

In what measure the graft reestablishes the normal internal secretion has, however, not so far been determined.

2. From a clinical point of view it is impossible in nearly all the cases to ascertain the effects of the grafts; and if many patients are said to have been relieved, very few have derived any appreciable advantage from them.

3. The methods of ovarian transplantation as proposed and practised by Carrel, though they present a certain physiologic interest, should not be adopted because the sequelæ are uncertain and remote, and the procedures are too grave to warrant the hypothetical result.

4. The practice of the ovarian graft in woman therefore has been of momentary interest altogether, and its most enthusiastic partisans (Morris, Manclaire) have not practised it more than twenty times in ten years. I. R.

IONIC SURGERY IN THE TREATMENT OF CANCER. WITH A CHAPTER ON IONIZATION IN SURGICAL TUBERCULOSIS AND IN HEMORRHOIDS. By G. BETTON MASSEY, M. D., Attending Surgeon to the American Oncologic Hospital, etc. New York, A. L. Chat-terton Company. 1910.

The author is a strong advocate of the ionic treatment of causes and claims that the results are as good if not better than those obtained by the knife. After discussing the nature and diagnosis of malignant growths, the author describes the physics and methods of application in detail. The text is interspersed with numerous case reports, both successes and failures. The illustrations comprise descriptions of the apparatus and a large number of "before and after" photographs. E. T.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Toxemia of Pregnancy.—In discussing the pathogenesis of the toxemia of pregnancy, James Ewing (*Amer. Jour. Med. Sci.*, June, 1910) says that it appears not improbable [that some diffusible toxic agent may be closely connected with the symptoms of eclampsia, but the general facts of the disease strongly indicate that the eclamptic seizure can arise only in an organism long prepared for it by disturbance of metabolism and the associated organic changes. The great majority or possibly all eclamptic seizures are preceded by a period, sometimes called the preeclamptic state, marked by elevated blood pressure, headaches, edema, and intolerance of protein food. These

are the symptoms of a nephritis, and the kidneys in fatal cases almost invariably show that a nephritis, usually of the glomerular type, has existed for some time. The urine at this time commonly shows reduction in quantity, low urea, and high test nitrogen. These features persist throughout the eclamptic seizure, and indicate, as in the other forms of toxemia, defective urea-forming function of the liver and defective desamidization. If there is any single distinguishing causative element in eclampsia, the writer believes it is to be found in the nephritis and not in specific poisons from fetus, placenta, or uterus.

Lacerations of the Cervix.—E. S. Gushee (*Bull. of the Lying-In Hosp., N. Y.*, vol. vi, No. 3, 116) presents a study based on 1,000 primiparæ. Of these, 80.7 per cent. showed laceration of the cervix, 41.1 per cent. laceration of the perineum, and 33.3 per cent. laceration of both cervix and perineum. From this study the writer concludes that the cervix is injured more often than is ordinarily believed, that it is most commonly torn in a lateral direction, and if this is deep enough, there is great danger of severe hemorrhage, owing to the close relation of the blood-vessels to the side of the cervix; that the anterior lip of the cervix may be incised with advantage in order to avoid such extensive tears, that great care should always be exercised in all manipulations of the cervix; that there is great danger of lacerations from the aftercoming head following a version, that instrumental dilatation is dangerous even in the hands of the most expert; that the membranes must be preserved as long as possible, that if a deep cervical tear is suspected to be the cause of a postpartum hemorrhage, the laceration should be repaired at once; that the upper angle of the tear should always be closed first, and after the operation is done an inspection should be made for the purpose of determining whether the cervical canal is sufficiently large to provide for free drainage from the uterus during involution.

Influence of a Salt-free Diet in Habitual Death of the Fetus.—Prouvost (*Bull. de la Soc. d'obstét. de Paris*, March, 1910) gives the history of a case in which the ingestion of too much salt by the mother apparently caused death of the fetus by generalized edema, caused by intoxication with chlorides. The mother had two living healthy children, and then seven pregnancies in which the child was born dead with generalized edema. As she was very anxious to have children the mother was put on a salt-free diet, eating meals specially prepared without salt, except at dinner, which she ate with the family. This diet was kept up for some years, when pregnancy resulted in the birth of a living healthy child, followed two years later by a second living child, during whose period of gestation the salt-free diet was observed. The author believes that the results of treatment would indicate that the patient, who was exceedingly fond of salt, was unable to eliminate enough salt for two organisms, and that while her excessive salt eating did her no harm, the fetus retained an abnormal amount of it, which caused edema and death.

The Large Fetus.—Paul Delmos and Jean Delmos (*L'Obstét.*, April, 1910) consider as large fetuses those that weigh more than 3,250 grains. From the register of the Hospital of Montpellier the authors have collected 1,000 cases, of which forty-six were of abnormal size. The causes of abnormal size are various. The number of the child of the mother is important, as the weight increases with the number of the pregnancy; the uterus becoming less irritable when it has undergone a greater number of labors allows pregnancy to go on longer. The length of the pregnancy has an important effect. The age of the mother and the state of her nutrition influence the weight of the child. Pinard thinks that the length of the interval between the appearance of the menstrual period and the conception has the strongest bearing on the size of the fetus. Women who rest during pregnancy have larger children than those who work hard. The placenta is larger than in shorter pregnancies and the amount of amniotic fluid is greater. The difficulty of labor depends on the increased diameter of the head, which is hard and incompressible. The first consequence is the prolongation of labor; premature rupture of the membranes is a second. Operative interference is often necessary to effect delivery. Inertia and postpartum hemorrhage also occur. The prognosis for the fetus is bad, asphyxia often resulting. Fractures of the clavicle, prolapse of the cord, and hydramnios are other possible dangers. Finally, the large fetus is functionally inferior to the normal fetus.

Diagnostic Value of Search for Spirochæte Pallida in Umbilical Cord.—A. B. Emmons, 2d (*Bost. Med. Surg. Jour.*, 1910, clxii, 640), says that the establishment of a positive diagnosis of syphilis in the new-born may be a matter of the greatest importance both as regards prophylaxis and treatment. Nothing short of demonstrating the causative organism in its tissue can be considered as absolutely conclusive. When an autopsy cannot be made the study of the gross and microscopic anatomy of the placenta generally permits a probable, and usually an almost positive, diagnosis of syphilis. The significant points are briefly: The relative increase in the weight of the placenta as compared with that of the child. This ratio, which is normally one to five or six, is increased to one to four, or even one to two. The pale, greasy appearance of the maternal surface is characteristic. Most important, however, is the microscopic appearance of the teased villi, which are thicker, more club-shaped and less graceful and arborescent than usual, while the stroma cells are increased in number, larger and more spindle-shaped. At the same time the vessels are obliterated in the smaller and are the seat of pronounced endarteritic changes in the larger villous stems. Such changes, if present, make the diagnosis highly probable and amply justify specific treatment. Unfortunately, however, in a certain number of cases these signs are not clearly marked, and under such circumstances the finding of the spirochæte pallida in either the placenta or cord would confirm the diagnosis. The writer has studied the cords

of thirty cases at the Johns Hopkins Hospital, fifteen of which showed no evidence of syphilis in the child. The tabulated findings in the remaining fifteen show that the spirochæte pallida is rarely found in the cords of the syphilitic new-born. When positive results are obtained, they are present in considerable abundance in the muscularis of the umbilical vein in sections taken from the neighborhood of the umbilicus. A large proportion of syphilitic new-born, as shown by microscopic examination of the placenta, as well as by characteristic autopsy findings with the spirochæte demonstrable in the liver, show that the spirochæte could not be found in the cord even after extensive search. Accordingly, a negative diagnosis cannot be made by this procedure alone, though occasionally the search for the spirochæte in the cord may be of positive value as a clinical test.

Method of Determining the Virulence of Streptococci in the Puerperal State.—Fahre and Bourret (*Bull. de la Soc. d'obst. de Paris*, April, 1910) call attention to the existence of healthy carriers of streptococci; that is healthy women in whose lochia hemolysing streptococci are found after confinement. Up to the present time no reliable method for determining the virulence of streptococci in such cases has been found. The authors have made use of the lecithin-bouillon method, which depends upon the production by virulent streptococci of very few colonies on culture media, while the less virulent ones give many colonies. Lecithin bouillon is used as a culture medium mixed with blood agar in a Petri box. Blood serum may be used in the same way. Nonvirulent streptococci gave innumerable colonies. When more virulent, only about forty colonies were counted.

Results of Delivery and Treatment of Contracted Pelvis.—Otto Metzler (*Arch. f. Gyn.*, 1910, Bd. 90, H. 3) gives an exhaustive analysis of the cases of contracted pelvis treated at the University Hospital for women at Zurich from 1891 to 1909. In these eighteen years there were treated 19,726 cases of pregnancy; among these there were 2,622 cases of contracted pelvis with a conjugate of 11.5 cm. or under, or 13.3 per cent. of all the cases. There were 1,137 primiparæ and 604 in the second pregnancy. Ages were sixteen to forty-six years. The maternal mortality was 0.92 per cent.; the infantile, 14.91 per cent. There were 1,942 spontaneous births, with a mortality of 0.26 per cent. of the mothers and 4.2 per cent. of the children. There were 680 operative deliveries, with a maternal mortality of 25.94 per cent. and an infantile death rate of 41.32 per cent. The forceps was used 157 times; version 137 times; craniotomy 120 times; extraction 101 times; premature labor was induced 136 times; Cesarean section was performed twenty-two times with nineteen living children, and five mothers died. The practice at the hospital at Zurich is to wait as long as possible for spontaneous delivery to occur. Only when there is danger to the life of the mother or of the child is interference undertaken. Since the newer practices have been introduced into the hospital, that is since 1907, the results have been better than in the earlier

days, and a special analysis of these cases is given. In that time ninety-one cases have been delivered: eighteen forceps, ten high forceps, thirteen versions, seven extractions, eight perforations, four Cesarean sections, twelve premature labors, and seven hebosteotomies. Cesarean section is an operation that involves no danger for the mother. Hebosteotomy has a mortality of 4.95 per cent. and for the children of 9.6 per cent. Bladder weakness and incontinence of urine may also result from hebotomy. The premature induction of labor is a life-saving operation for the mother in cases of extreme contraction of the pelvis, and is practical outside the hospital for the general practitioner.

Transperitoneal and Extraperitoneal Cervical Cesarean Section.—Max Lange (*Monat. f. Geb. u. Gyn.*, May, 1910) thinks that hebotomy is a blind operation in comparison with the cervical Cesarean section. This operation has been replaced in the Posen Hospital since Dec., 1908, and the supravaginal section has been done in fifteen cases. The author prefers the transperitoneal route. He thinks that the peritoneum is often torn and that gauze pads are a better protection for the peritoneum than a suture placed after the membrane has been torn. In five cases the transperitoneal route was taken, in ten the extraperitoneal. Three cases were operated upon for eclampsia, one with contracted pelvis. In another case there was great edema of the vulva. All three were transperitoneal operations. Placenta previa is not regarded as a legitimate indication for Cesarean section. Thirteen of the cases operated on had no complications during the puerperal period. The results for the children were good; eleven were born normal, four asphyxiated, of whom three were easily resuscitated. One premature child in a case of eclampsia was dead. One child had a hydrocephalus. Thirteen children left the hospital in good condition. In the author's cases the trans- and extraperitoneal methods gave equally good results.

Scopolamin and Morphine in Narcosis and in Childbirth.—In a report to the Council on Pharmacy and Chemistry of the American Medical Association, R. A. Hatcher (*Jour. Amer. Med. Assn.*, 1910, liv, 446, 516) states that the use of scopolamin and morphine alone, and unsupported by chloroform, ether, or other anesthetic, is wholly unsuited for general anesthesia. The use of scopolamin and morphine preliminary to that of chloroform or ether has certain advantages, but it renders the problem of anesthesia more complicated, requiring extreme care, judgment, and discretion. There are numerous contraindications to the use of scopolamin and morphine, both in surgery and in childbirth. It seems probable that scopolamin and morphine may have a sphere of usefulness in childbirth as well as in surgery, but there are many details which require perfecting before they can become generally useful even in institutions. Scopolamin and morphine are wholly unsuited in the present state of our knowledge, for use in general obstetric practice. The pharmacology of scopolamin and morphine, and of the interactions of the two, are of prime importance in the study of their uses in surgery and obstetrics. There is no

possible excuse for the employment of ready-made mixtures (pills or solutions) of scopolamin and morphine, since each substance must only be used with reference to its individual actions, bearing in mind that these actions may be greatly augmented or modified by the other alkaloid. The danger of the child must be kept constantly in mind, even when the utmost care has been exercised in the selection of cases suitable for the use of scopolamin and morphine in childbirth, and when small doses are ineffective in inducing the "twilight sleep," large doses should not be used.

Typhoid Fever and Pregnancy.—S. M. Brickner and B. S. Oppenheimer (*N. Y. Med. Jour.*, Feb. 12, 1910) discuss the problems connected with such a case which they report. Concerning the possible transmission by placenta from mother to fetus they say that in their case the placenta appeared to be normal on microscopical examination. Cultures from the placenta as well as of the colostrum were negative. There were no symptoms of typhoid in the child. As regards placental transmission of agglutinins, the maternal blood immediately after labor showed a positive Widal reaction in all dilutions up to 1:250 within an hour, the blood from the fetus, from the umbilical cord, and from the placenta being negative. In regard to the transmission of agglutinins from mother to infant through the maternal milk, the writers state that although the colostrum showed the Widal reactions in dilutions of 1 to 40 in one hour, the infant's blood after four days of attempted maternal feeding, showed no clumping.

Tests for the Transmission of Syphilis.—Oskar Frankl (*Monat. f. Geb. u. Gyn.*, March, 1910) gives the results of tests for syphilis by the Wassermann and Bauer reactions in eighty-seven cases. A large number of apparently healthy women were tested to see if latent syphilis could be demonstrated. Out of fifty cases of mothers and children there were two positive reactions in mothers and one in mother and child. There was no history and no evidence of syphilis in either. This shows the care that should be taken in selecting a wet nurse. Every such nurse should be tested for syphilis, and there seems equal reason why every child that is to be wet-nursed should also be tested lest he infect his nurse. Out of seventy-nine cases of latent syphilis, four of which had undergone careful treatment, the test was positive in fifty-four. Of those never treated 88 per cent. were positive; of those who had taken but one course of treatment, 68 per cent. positive. Those who had been carefully treated were negative. There were eight cases in which the mother was sound and showed no signs of syphilis, but the child was undoubtedly syphilitic. In six the fetus was macerated; in two it was living, but covered with pemphigus, and both died in a short time. Both children gave a positive reaction. All these mothers reacted positively, showing latent syphilis, and two of them showed exanthems later. In cases of latent syphilis, the child reacting, the mother

should be submitted to treatment without waiting for the exanthem.

Treatment of Uterine Rupture.—Edmund Issel (*Monat. f. Geb. u. Gyn.*, April, 1910) gives the histories of seven cases of uterine rupture observed by him. Of these patients, seen during the past five years at the Hospital in Krönig, one died immediately without treatment. The other six patients were operated on; four recovered, while one died six days after operation of hemorrhage from the field of operation, and one of peritonitis. Of the four cases which recovered, one underwent total extirpation with vaginal amputation: in five cases the rupture was sutured. Operation is necessary in this condition; the only question is what operation is the best, and whether the abdominal or the vaginal method should be used. The question lies between total extirpation and suture of the rupture. The author prefers total extirpation, since the dangers of sepsis are minimized. Whether operation should be made by the abdomen or vagina depends on the location of the rupture. The diagnosis is often not made at the time of rupture, but hours or days later, when hemorrhage has gone on and sepsis is near. Here the complete removal of the infected organ is necessary. The author advocates bringing these cases to a hospital for operation. Ligation of the hypogastric and spermatic arteries will often save life by preventing hemorrhage and fatal loss of blood.

Rupture of the Symphysis During Labor.—L. A. Kriwsky (*Monat. f. Geb. u. Gyn.*, April, 1910) gives the number of cases of rupture of the symphysis that have been published as 134. The causes may be summarized thus: infantilism; contracted pelvis; osteomalacia; new growths; acute and chronic inflammations; changes in the joints after severe labors; spongy condition in the joint due to pregnancy; malpositions; disparity between the diameters of the fetus and of the pelvis; muscular contractions affecting the pelvis. Rupture is divided into the two kinds, traumatic and spontaneous. The symptoms are outward rotation of the thighs, impossibility of active movements, pain on passive motion. The urethra may be ruptured at the same time and cause incontinence of urine. In the author's case there was great swelling of the soft parts, and a cleft between the bones into which two fingers could be thrust, with feeling and sound of grating on movement.

Increase of Chlorides in the Blood in Pregnancy and Puerperal Eclampsia.—A. Javal (*La Gyn.*, March, 1910) has made a study of ten cases of eclampsia at the St. Antoine Maternity, and has compared the blood collected during and after the crisis with that of normal women. All except one had a manifestly hypertonic serum during the crisis: The amount of albumin in the urine was not affected by the crisis; in some of the patients there was an increase of urea; after the crisis the chlorides were diminished in all cases, while during it they were increased. In eclampsia there is increased arterial tension. This is due, ac-

cording to the author, to pressure on the ureters which brings about retention of chlorides. This calls for fluid and makes a true edema of the blood; hypertension results. Retention of chlorides is responsible for hypertension, and this permits the kidneys to disembarass themselves of the excess of chlorides. But this action is not long sufficient to get rid of the excessive chlorides. Marked increase of chlorides in the blood lasts but a short time. When we find chlorides increased in the urine we should be prepared for eclamptic attacks and should watch over the patient to prevent them. Hence this is a predisposing cause of eclampsia.

Scarlatina in the Puerperal State.—A. Bonnett-Laborderie (*Jour. des sci. méd. de Lille*, March 26 and April 30, 1910) believes that it is an error to consider that there is a special septicemia due to scarlatina, and thinks that scarlatina, when it occurs in a puerperal woman, is merely an intercurrent disease. He gives two cases in young women who had been confined at the Hospital who contracted scarlatina during their puerperal days, and in both it was no more serious than is usually the case with scarlatina. There were no abdominal symptoms. The polymorphism of scarlatina sometimes makes the diagnosis difficult. The symptoms are often of the abortive type. The eruption generally appears on the trunk and abdomen and the face is often clear. Young infants are relatively immune to scarlatina, and a mother having the disease should be allowed to nurse her infant, since she confers on it some immunity to the disease.

Incoercible Vomiting of Pregnancy.—P. Guibal (*Gaz. de Gyn.*, April 1, 1910) says that incoercible vomiting in pregnancy is attributed to three sets of causes: neuropathic troubles pre-existent to pregnancy; nervous troubles reflex from the genital organs; gravidic autointoxication. The author believes and endeavors to show that autointoxication cannot be a cause, on account of the rapidity with which the vomiting ceases as soon as the uterus is emptied. He believes these troubles to be due solely to a reflex from the uterus. He gives the histories of four cases observed by him in which the emptying of the uterus put an end to vomiting that seemed to threaten life itself. Toxins could not have been eliminated so rapidly.

Basedow's Disease and Pregnancy.—E. Bonnaire (*Presse Méd.*, April 6, 1910) considers that hypertrophy of the thyroid is normal in the pregnant woman. Goiters already existing at the beginning of gestation increase in size as pregnancy advances; the increase in size begins earlier in multiparæ than in primiparæ, in whom it commences during the sixth month, and begins to disappear on the seventh day after labor. Of the patients who have this enlargement, none have albuminuria, while in those who do not have it, albuminuria is apt to be present. The ingestion of thyroid extract causes these troubles to disappear, stopping the albuminuria. The hypertrophy or functional hyperactivity of the thyroid is transitory but necessary. Hypothyroidism is

unfavorable to pregnancy. Excess of volume of the thyroid is not to be confounded with hyperthyroidism. The theories of causation are thyrogeneous, hematic, and nervous. Exophthalmic goiter is six times as frequent in women as in men. It is almost exclusively an affection of the period of sexual activity. The course of Basedow's disease may be influenced by pregnancy, may begin during the puerperal state, or an existent goiter may take on the Basedow's type during pregnancy. When this condition is present marriage is not advisable; in a wife, pregnancy is contraindicated; a mother should avoid nursing. Out of 15,000 women delivered in the hospital of Edinburgh there were coexistent pregnancy and Basedow's disease in only one patient. The author saw but two in 30,000, in twelve years, at the Lariboisière. He reports these two cases. In one the disease was produced by pregnancy; in the first pregnancy there developed an increase in the size of the gland; in a second, the symptoms of Basedow's disease appeared, with acute asystole, paralysis of the right heart, and pulmonary congestion. The condition seemed to be of nervous origin. The uterus became relaxed after labor and caused uterine hemorrhage. The dangers that are to be feared in such cases are cardio-pulmonary and hemorrhagic, occurring before or after labor. Opothrapy gives varied results in these cases. Emptying of the uterus is the best treatment in severe cases. It may become necessary to ligate the arteries which supply the thyroid.

Should the Cesarean Operation be Performed for Hemorrhage due to Vicious Insertion of the Placenta?—J. Mouchotte (*Ann. de Gyn. et d'obst.*, April, 1910) gives the results of a study of 183 women treated for placenta previa at the Baudelocque, by the method of Pinard, from 1895 to 1908. Out of 38,015 women who entered, 183 had placenta previa, or 0.48 per cent. Of these only four deaths occurred. Of the products of conception 101 lived to leave the hospital, and eighty-two died. Of the mothers that died one died of infection received before entering the hospital from a careless attendant. The second died on account of too much delay in using a balloon for dilatation. In the third case the balloons repeatedly tore and so much loss of blood occurred that death was the result. The fourth was exsanguinated when she arrived at the hospital. Of the eighty-two children who died, three were dead from hemorrhage before entrance; fifty-six died in the course of labor, and twenty-three shortly after birth. Forty-six were too young to be viable, died early in labor, or were otherwise incapable of life; thirty-six remain, all of which were in bad condition when the mother entered the hospital; eleven were premature and died of debility; two others were children of dead mothers. Of all these cases the first category were not subjects for the Cesarean section; the second category were in such bad condition that no risks for the mother were advisable to save their lives. Of the twelve children who might have lived, three mothers were infected; in one there was excess

of amniotic liquid. Only five children were well developed and clinically well when they entered, and presented all the conditions for a successful Cesarean section. The method of Pinard is to introduce a balloon as soon as the patient's pulse is above 100, after rupture of the membranes. This stops hemorrhage and dilates at the same time. The indication for the Cesarean section is not at all certain in placenta previa; in exceptional cases it is of advantage.

Supravaginal Hysterectomy without Previous Evacuation of the Gravid Uterus at about the End of Pregnancy.—A. Couvelaire, (*Ann. de Gyn. et d'obst.*, April, 1910) gives a résumé of six abdominal hysterectomies done on the gravid uterus at about term. He reports the removal of the uterus in a woman who had been in labor for thirty-six hours before she was brought to the Baudelocque, on account of cicatricial stenosis of the vagina, and of the cervix which was undilatable, and an intense vaginitis. The removal of the uterus was easy, and there was no difficulty in controlling hemorrhage. The patient had been delivered normally four times previously, and the dystocia was an entire surprise. After the third labor there was a marked greenish discharge from the vagina. In her fourth pregnancy she had a very severe leukorrhea which caused an exploratory laparotomy to be made, but pregnancy went on to term. There was an intense granular vaginitis, but delivery was normal. There were gonorrheal lesions which, combined with traumatism at labor, caused cicatricial stenosis which was the obstacle to delivery two years later. In such cases near labor in undesirable conditions, supravaginal hysterectomy is more useful than total hysterectomy. It permits of not entering the infected vagina, and perfectly isolates the peritoneal cavity from the vagina. There is an advantage in sectioning the cervix last of all; after division of the round ligaments and vascular pedicles the uterus is easily drawn out of the abdomen. By placing two clamps, one on each side of the inferior segment, the uterus may be amputated without getting the infected discharge into the peritoneal cavity. The fetal part which presents does not interfere with this maneuver. Hysterectomy is done by successive sections, symmetrical and descending.

Care of the Breasts During the Puerperium.—H. E. Lindeman (*Bull. Lying-in Hosp. N. Y.*, vol. vi, No. 3, 127) reports the results obtained with Williams' method in a series of 100 cases. This method is characterized by the omission of breast binders in ordinary cases and the use of loose supporting binders in patients with large or flabby breasts. Half-grain doses of codeine are given every four hours if the breast becomes painful, and no particular attention is paid to the bowels or the diet. The fluids are not restricted nor are the patients purged. The chief results of this method of treatment were excellent, and simplicity which characterizes it constitutes a source of great satisfaction to nurses and patients.

Morbid Anatomy of the Toxemias of Pregnancy.—J. E. Welch (*Bull. Lying-in Hosp. N. Y.*, vol. vi, No. 3, 131) reports on a series of sixteen cases in which postmortem examinations were made. In addition to diffuse hemorrhage in various parts of the body, a marked hemolysis is usually found. About 50 per cent. of the eclamptic sera will destroy more or less of the red cells of the normal individual, and just as often the sera of normal individuals destroy the red cells of eclamptics. It was found that the injection of 150 c.c. of eclamptic serum obtained by venesection from a patient who had had her twentieth convulsion, did not produce any disturbance when injected subcutaneously into the normal human subject. Welch states that the hemorrhages may often be explained by the processes of thrombosis and embolism. In addition to these, another cause is the solution of the lining endothelium of the capillaries and small blood-vessels, which produces a weakness of their walls. Increased blood pressure is also a factor in increasing the extensive hemorrhage which may occur from the causes mentioned. The writer did not find any lesions in the fetus which corresponded to those in the adult. As far as he could judge from a microscopical examination of the thyroids, their structure was quite normal.

Rupture of the Uterus Treated by Vaginal Suture.—H. J. Patterson (*Lancet*, Feb. 19, 1910) reports a case of rupture of the uterus with prolapse of a loop of intestine and free arterial hemorrhage from the parametrium, the cervix was completely torn through, the tear extending upward and involving the uterus for a distance of at least 4 inches. The torn edge of the cervix and lower part of the uterus were approximated by three stout catgut sutures. The torn edges of the peritoneum and vaginal wall were seized with forceps, and a purse-string suture was passed right round the tear, the suture being passed alternately through the vaginal wall and peritoneum. A large rubber tube was then inserted into Douglas's pouch, and the purse-string suture was passed tightly round it. The tube was removed in six days. Recovery.

Treatment of Pyelitis of Pregnancy.—P. M. Pilcher (*Surg., Gyn., Obst.*, Feb., 1910) says that during the course of cystoscopic examinations he has often observed that when the patient was in the recumbent position the droppings from the ureteral catheter came very slowly, but as soon as the patient was raised up, and especially if she assumed the sitting posture, the droppings increased fifteen to twenty times the number that were previously noted. His conclusion was that there was more to be gained from favoring drainage of the renal pelvis by a position in which the kidney was on a higher level than the bladder than there was from any fancied relief of pressure on the ureters, such as some attempt to obtain by putting the patient in the knee-chest position. In a given case it is perfectly safe, should the symptoms not be too severe, to wait for eight or ten days without attempting to catheterize the ureters; if at the end of

this time there be a persistent temperature with pain and pyuria, or even without pain, it is indicated to pass a catheter to the pelvis of the affected kidney to drain it thoroughly, and then instill one dram of 25 per cent. argyrol solution. If there is a large amount of retention in the pelvis of the kidney, with considerable pus present, it is indicated to leave the ureteral catheter in place, after washing the pelvis of the kidney, for four or five hours or even longer, repeatedly washing the pelvis of the kidney with some antiseptic lotion.

Case of Congenital Varicella.—Brindeau (*Bull. de la Soc. d'obst. de Paris*, April, 1910) gives the history of a patient who at about the time of delivery was sick with varicella in a light form, but with a marked generalized eruption. She was confined six days later, the child being large and well developed. On the fourth day after birth the first vesicle appeared on the child's face; the eruption generalized gradually and the child recovered perfectly. The author considers this a typical case of congenital varicella, the period of incubation being fourteen days. New-born infants are particularly susceptible to the contagion of varicella.

Albuminuric Retinitis during Pregnancy.—Commandeur and Gonnet (*Bull. de la Soc. d'obst. de Paris*, April, 1910) give histories of two cases of albuminuric retinitis in pregnant women, both in the eighth month of pregnancy. The eye lesions were very marked. In the first patient the fetus died *in utero*; labor came on spontaneously. In the second, premature labor was induced. In both cases the result was a rapid disappearance of symptoms. Interruption of pregnancy has a happy effect on albuminuric retinitis. Ophthalmologists state that retinitis makes the prognosis for the pregnant woman very bad, the majority of patients dying within two months of its appearance. Since 1876 the authors have seen seventeen cases in addition to these two. Out of twelve cases left alone, two died, seven were interrupted, with one death from rupture of the uterus; of ten not treated by induction of labor, three became blind; none of those treated by induction of labor lost their sight. Of eleven interrupted after the sixth month, only one lived. Artificial interruption improves the prognosis for the mother, but makes that of the child very poor.

Value of the Serum of the Renal Vein of the Goat in the Albuminuria of Pregnancy.—Daunay and Lequeux (*L'Obst.*, March, 1910) have applied the method suggested by Teissier for the treatment of uremia of pregnancy, the injection of goat serum derived from the renal vein, on the hypothesis that there is a secretion derived from the kidney that is of especial value to the organism. Teissier insists that the toxicity of the urine is diminished in the course of these injections. Possibly there is a stimulating action on the epithelium of the glomeruli. Introduction of normal albumin may displace and liberate the combination of toxalbumins retained in the tissues, and favor their elimination. The authors treated three cases of albuminuria

of pregnancy by this method and give the results of their investigation. The serum of the kidney of the goat causes only transitory diuresis. It acts very differently on albuminuria in different cases; in general it does not retard the march of the disease unless the milk diet has already done so. There is an increase of the granular cells in the blood after each injection.

GYNECOLOGY AND ABDOMINAL SURGERY.

Treatment of Prolapsus Uteri.—J. I. Parsons (*Jour. Obst. Gyn. Brit. Emp.*, 1910, xvii, 111) claims that, in 178 cases, injection into the broad ligaments of sulphate of quinine dissolved in water and sulphuric acid has resulted in permanent holding up of the uterus in 75 per cent. of the cases, in great improvement in 20 per cent., and failure in 5 per cent. The uterus is held up with a cup and stem pressary for only three days while an exudate is forming. The time the patient must remain in bed depends upon the duration of the prolapse; the extent of the prolapse; the amount of the effusion found on examination ten days after the operation; the social position of the patient, and the amount of work she will have to do after going home.

Ovarian Grafts.—Louis Sauvé (*Ann. de gyn.*, Feb., 1910) gives an exhaustive study of the literature of ovarian grafting and sums it up in a few words. Ovarian grafts can be absolutely made to take without complicated technic and vascular anastomoses; the autograft succeeds in 50 per cent. of cases, the heterograft exceptionally, and produces an ectopic ovary. The graft seems to be able to carry out the ovarian functions even to ovulation. It can produce ovules, but as to its action in producing an internal secretion we know little. The most important cases reported are that of Morris in which a woman with infantile uterus and no menstruation became regular and normal, which is very strong evidence, and one of Pavlov's cases. One of Morris's was followed by pregnancy. Out of sixty cases published a single one seems proved, and about ten gave interesting results. Accidents occurred in several, rendering the woman so uncomfortable that she wished the graft removed; they were in the nature of periodic pain and swelling of the graft. Death has never occurred as a result of grafting. The indications for grafting are ovarian insufficiency and infantilism. Autografts are normal, heterografts abnormal in form.

Use of Oil in Abdominal Surgery.—D. P. D. Wilkie (*Surg. Gyn. Obst.*, Feb., 1910) has performed the following experiment on six cats and six rabbits. The animal's abdomen was opened with aseptic precaution, the surface of the small intestine, over about sixteen inches of its length, was scrubbed with dry gauze and scraped with a knife till bleeding points appeared. Six weeks or two months later the abdomens of the twelve animals so treated were reopened and in all adhesions were present, though they were never very extensive. These adhesions were broken

down, leaving raw surfaces. In six of the animals oil was then smeared over the raw surfaces and the abdomen closed. In the control animals the adhesions were broken down but no oil used. The animals were opened again four weeks later, and it was found that in those in which oil had been used the adhesions were very much fewer and less dense than in the controls. The writer concludes that sterile oil may be advantageously used on denuded surfaces in operations for peritoneal adhesions. Another series of experiments consisted in amputating the appendix of a rabbit and invaginating the stump. The cecum and some inches of the ileum were scrubbed with a piece of dry, sterile gauze to produce an abrasion of the peritoneal coat. One or two loopfuls of an emulsion of staphylococcus aureus (from one-fiftieth to one-twentieth of the lethal intraperitoneal dose) were then introduced into peritoneal cavity and the abdomen was closed. The same procedure was carried out on a second rabbit with this addition, that before closing the abdomen some sterile vaseline oil was poured over the intestines. The results showed that recent plastic adhesions (even of thirty-six hours' duration) are capable of causing complete intestinal obstruction; and, second, that the use of sterile oil applied over abraded peritoneal surfaces in cases of abdominal infections is of great value in preventing obstruction from recent adhesions. The writer reports the use of sterile vaseline in two cases of generalized peritonitis as favoring drainage and intestinal peristalsis and preventing the formation of adhesions.

Microcystic Ovary.—Emile Forgue and Georges Massabau (*Rev. de gyn.*, March, 1910) tell us that microcystic ovaries are frequently encountered in operations for other gynecological troubles. The authors have made a systematic study of the ovaries in twenty-three cases operated on by them, with reference to the pathogenesis, production, and clinical rôle that such cysts play in pelvic pathology. There can be no doubt that these microcysts can be found under physiological, as well as pathological conditions. They are seen even in the new-born. In the third year of life they are found in all ovaries examined. The ovaries of pregnancy are increased in volume and contain very many cysts. There are three types of pathological ovaries which contain microcysts: edematous inflamed ovaries, large polycystic ovaries, and sclerocystic ovaries. The inflamed ovaries are large, soft, covered with soft adhesions, irregular, but not as frankly rugous as those of the sclerocystic form. The large cystic ovaries are generally degenerated lutein-celled ovaries. The sclerocystic ones are hypertrophied, rugous, scarred with bands of cicatricial tissue, hard on section, the stroma between the cysts being sclerosed. All these forms may contain cysts with hemorrhagic contents. These ovaries accompany many forms of pelvic disease—ovarian and parovarian tumors, uterine cancer, sarcoma and myoma, hydatid moles, chorioepithelioma, syncytioma, inflammatory lesions of the

pelvis, intestinal and appendicial disease, lesions of the uterus and tubes, and pelviperitonitis. They occur in young girls, and in women about the menopause. They are generally bilateral. In this type of ovary the tubes are generally not involved, but the uterus is rarely normal. Retrodeviations are frequent. These cysts are follicular, ruptured or unruptured, or from the corpora lutea. The number of follicles is increased, and an exaggerated atresic degeneration goes on, ending in cicatrization or increase in size of the cysts. The ovule early becomes altered; a cavity forms between the zona pellucida and the ovular protoplasm; the mononuclear leukocytes invade it, and the epithelium degenerates. Normal follicular atresia may go on to formation of lutein cysts. Although a few cysts may be found normally, the exaggeration of this condition is always pathological. These changes occur frequently without a causal infection. The theories as to their causation include inflammation, congestion, and dystrophy. They result really from an augmentation of the secretion of the uterus from any cause, a true nutritive activity.

Prolapse of the Urethral Mucosa in Woman.—R. Pichevin (*Jour. de méd. de Paris*, April 12, 1910) describes a case of prolapse of the urethral mucous membrane in a woman, which simulated a tumor of considerable size between the labia. The tumor became very much swollen at one time. Such a prolapsus may occur in elderly women, by the gliding on itself of an entire cylindrical section of the mucosa of the urethra. The symptoms are increased frequency of urination and some pressure feeling in walking. The predisposing causes are unusual efforts, as in coughing, and age. The walls of the urethra become hypertrophied, and inflammation may occur, which may cause cystitis or urethritis. The tumor may even become gangrenous. The treatment is destruction of the superabundant mucosa by ligature or cautery.

Primary Cancer of the Fallopian Tube.—Alban Doran (*Jour. Obst. Gyn. Brit. Emp.*, Jan., 1910), in concluding his second paper on this subject, brings his tables of reported cases up to 100. He finds that, as in other types of cancer, primary cancer of the tube is most frequent at and for a few years after the menopause. Two patients of the 100 had passed their sixtieth year and one was only twenty-seven. The menstrual history is so inaccurately reported in most of the recorded cases as to be of no value. It is probable that parous women are most subject to the disease in question. The duration of the special symptoms of pain, swelling, and discharge was not reliably noted in the majority of the cases. In twenty-four cases where this information was given in one the symptoms had not been observed over one month; in two they had been noted for about six weeks; in three, for about three months; in two, for four months; in six, for six months; and in eight, for about a year. In two there was a definite history of menorrhagia and watery discharge for three years. Pain is apparently complained of

when there is any obstruction to the escape of the watery fluid secreted by the new growth. In all the cases swelling of some kind was noted, ranging from a distinct resistance in one of the lateral fornices to an abdominal tumor. Where there is clearly a tumor more or less distinct from the uterus, a watery vaginal discharge is the most important of all the symptoms, occurring in over 27 per cent. of the recorded cases. Evidence of peritoneal effusion caused by escape of discharge from the tube into the peritoneal cavity is found in only 6 per cent. This must mean that the tubal ostium as a rule becomes closed very early when the tumor is malignant, for these tumors are generally villous or papillomatous, and it is well-known that a free growth of this kind developed on the surface of the ovary, tube, or mesosalpinx will cause free intraperitoneal effusion even when its extension is very limited. Most of the cases give a history of some inflammatory trouble. Cancer of the tube is bilateral in over one-third of the cases on record. As it is possible to collect 100 cases, as the writer has done, primary cancer of the Fallopian tube is clearly not a malady of extreme rarity. Since in at least 27 per cent. of all cases distinct and more or less free watery discharge was present, it is evident that, when this symptom is found to be associated with a pelvic or abdomino-pelvic tumor, an exploratory operation should be performed, and that if a tumor of the tube is detected, the uterus and the remaining appendages should be removed as well as the affected tube. In the same journal cases of primary cancer of the Fallopian tube are recorded by Herbert Spencer (3), Walter Tate (2), and T. P. Legg (1).

Spread of Carcinoma by the Fallopian Tube.—Glendining (*Jour. Obst. Gyn. Brit. Emp.*, Jan., 1910) notes two cases of dissemination of cancer by the Fallopian tube occurring in association with secondary growth in the ovary. The primary growth in each case originated in the stomach. In both instances there are found in the Fallopian tube and permeating its tissues, numerous minute and discrete cancerous deposits arranged in such a manner that it is not at once easy to determine in what direction they are passing or at what point or points they have entered the tissues. In Case I there are found: 1, free cancer in the lumen of the Fallopian tube; 2, extensive permeation of the subepithelial tissues and the plical folds associated with 3, comparatively little invasion of the muscular wall and of the mesosalpinx, and 4, the amount of growth and the number of discrete nodules are greatest at the ampullary extremity and in the fimbriæ, and decrease as one proceeds toward the uterus. In Case II the processes are in a slightly more advanced state, as no part of the specimen is devoid of growth which extends as far as the point of section of the appendage from the uterus, but diminishes in amount as it nears its insertion. The plical folds show more extensive deposit, which in a few instances is sufficient to cause destruction of the columnar epithelium and

the subepithelial tissues. Throughout the whole length there is observed slight permeation of the muscular lymphatic channels. In the lumen small masses of cancer are found in every segment. In sections passing through the free end of the tube, and therefore cutting across the fimbriæ as they float in the abdominal cavity, small masses of cancer are encountered lying between two apposed surfaces of the fimbriæ. Elsewhere in the same sections cancer cells may be seen immediately adjacent to the epithelium, and if traced serially they are found to form into a small mass which eventually enters a lymphatic vessel. In this case also the growth may be noted permeating the lymphatics to the efferent vessels accompanying the arteries of the broad ligament. The histological examination points to the view that invasion of the Fallopian tube in carcinoma is brought about by cancer cells, which, coming into contact with the fimbriæ or being swept into the lumen, engraft themselves upon the columnar cells and thence travel to deeper parts. At present, however, the possibility of lymphatic permeation from the ovarian growths cannot be entirely excluded.

Pelvic Metastasis in the Diagnosis of Hopeless Abdominal Carcinoma.—D. W. Palmer (*Surg. Gyn. Obst.*, Feb., 1910) has studied the records of 435 consecutive cases of carcinoma of the upper part of the abdomen from the histories of the Mayo clinic in Rochester, Minn. He found that of these, 6 1/2 per cent. showed pelvic transplantation deposits as the earliest clinical sign of inoperability. Seven and two-tenths of stomach carcinomas had this sign. Fifty-five per cent. more cases were shown to be inoperable through a thorough rectal examination for pelvic metastasis than because of the presence of supra-clavicular gland metastasis. Pelvic metastasis warrants a most unfavorable prognosis as regards life expectancy. The pelvic metastasis is found at a point about 3 to 5 inches from the anus along the anterior rectal wall.

Use of Ovarium-Poehl in Amenorrhea.—Aram Mekerttschiantz (*Gyn. Rund.*, 4 J. H. 7, 1910) details the use of a new preparation of the ovary brought out by Poehl for use in amenorrhea. It has been shown that there are certain chemical substances derived from the ovarian substance that at the menopause cause a form of auto-intoxication. In a case of Pankow's in which an ovarian graft had been implanted it became necessary to remove the graft because of severe hemorrhages. In this patient the graft was made to relieve symptoms of an artificial menopause from panhysterectomy. Chrobak says that the ovary has three functions: the production of the ovum, the regulation of menstruation and nourishing of all the genital organs, and an influence on the nervous system. This is due to a chemical secretion from the liquor folliculi, produced by the cells of the theca folliculi. The author details seven cases in which ovarium-Poehl was used in amenorrhea. Amenorrhea may be divided into three groups: that due to congenital or

acquired disease of the genitals; that due to general diseases; and those cases that are termed functional because no lesions are found. In some cases of amenorrhea there are symptoms of intoxication, such as headache, vomiting, nausea, etc. The use of ovarium-Poehl has relieved all these symptoms and in several of the cases brought about a cure of the amenorrhea. The nervous system was quieted and the appetite improved.

Actinomycosis of the Uterine Appendages.—Carl Wagner (*Surg. Gyn. Obst.*, Feb., 1910), in reporting a case of actinomycosis of the appendages in a woman of nineteen, with recovery after bilateral removal of the adnexa, says that no case has heretofore been recorded in this country and only twenty-four have been reported in Europe. He regards this lesion as probably always a secondary infection. The infection takes place from the gastrointestinal tract, and may be most frequent from the appendix. The mode of secondary infection is by infiltration, penetration, continuity, and contiguity. Actinomycosis of the ovary and tube in long-lasting cases is surrounded by dense, connective tissue formation, which may lead to erroneous diagnoses or different kinds of tumors of hard consistency. The gross macroscopic and microscopic picture resembles that of tuberculosis in many cases. Bollinger's desideratum for the diagnosis of actinomycosis, namely, that corpora flava must be present, is untenable at the present time. Repeated bacteriological examinations, and sometimes long and tedious ones of the same specimens, must be made, to insure a correct interpretation of suspicious pathological material. Inoculation with pure cultures into the animal is not attended with success. Only the injection of pus with actinomycosis, or the ingestion of material upon which actinomycosis is grown, will prove successful in the production of actinomycosis in the animal. Actinomycosis does not travel by the lymphatics, and probably not by the blood route. The prognosis is favorable in circumscribed cases, which is most likely the condition in which we find the uterine appendages. The treatment consists in radical extirpation and free drainage; the application of tribromphenol-bismuth, or irrigation of the fistula with copper sulphate. The internal administration of iodide of potash up to 75 grains a day exerts a positive healing effect. A careful study of apparently innocent pus from pelvic disease as well as secretions from obstinate fistulas after laparotomies for ovarian and tubal-pus infections may result in finding actinomycosis to be the cause of the pathological changes more commonly than has been heretofore supposed probable.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

INTUSSUSCEPTION.*

BY

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(With three illustrations.)

Etiology.—The essential cause of intussusception is irregular peristalsis, particularly atony of one part with increased activity of adjoining parts of intestine. It may thus follow any limited, sudden, and severe peristalsis. Nothnagel's experiments on animals seem to prove this. In artificial intussusceptions produced in animals by an electric current he found, first, a contraction of a certain part of the intestine, and then, if this occurs abruptly, the normal gut below this point turns upward, and folds upon the contracted portion above, thus forming a minute intussusception.

Nothnagel also demonstrated this by paralyzing a certain part of the intestine by crushing it, which in a way explains the possibility of a blow to the abdomen producing an intussusception. In fact, many cases of intussusception are preceded by an injury to abdomen. From the above experiments it would seem quite probable that pathological intussusceptions are produced in essentially the same way, *i.e.*, by irregular peristalsis.

Predisposing causes are age, sex, climate, intestinal disturbances and injuries to abdomen. Intussusception is most commonly seen in children. Osler states that 34 per cent. of all cases occur under one year and 54 per cent. under ten years. Of 103 cases in children, according to Wiggins, 50 per cent. occurred in the fourth, fifth, and sixth months. In 358 cases collected by Holt, under ten years, 75 per cent. occurred in the first two years and 50 per cent. of them between the fourth and

* Read before the Brooklyn Hospital Club, April 13, 1910.

ninth months. The figures of Wiggins and Holt give a higher percentage occurring during the first year than those of Osler; nevertheless, they correspond sufficiently to show the greater frequency of intussusception during that time. The greater frequency of occurrence in children is probably due to the thinness of the intestinal walls, the greater mobility of the cecum and ascending colon, and the more frequent intestinal disturbances so common in children.

Intussusception occurs almost twice as often in males as in females, a fact for which we have no plausible explanation. It seems to be more prevalent during the summer months, probably because intestinal disturbances are more frequent during this period. In some cases we get a history of diarrhea, constipation, colic or dysentery, which act, no doubt, as predisposing causes.

Children are frequently attacked with colicky pains, which disappear in a short time. Many authorities regard these as intussusceptions, which reduce themselves spontaneously. Occasionally polypoid tumors within the bowel are dragged forward by the peristalsis and carry the higher part of the intestine to which they are attached into the lower part, thus causing an invagination.

Varieties.—Intussusception may occur at any point in the intestinal tract. Those occurring in the small intestines are called enteric, and those in the large intestines, colic. Other varieties are: 1, ileocecal, where the ileum enters the cecum—a type found in 75 per cent. of the cases; 2, ileocolic, where the ileum enters the colon; 3, ileal, where the ileum is alone involved; 4, colicorectal, where the colon descends into the rectum.

There is another form which is called intussusception of the dying, which is usually multiple and rarely found in children over two years. They are probably produced in the death agony and are of no clinical importance since they give rise to no symptoms. It may be interesting to add that Holt has found this condition in 8 per cent. of all autopsies on children. Besides the above classification we divide this condition into acute, sub-acute, and chronic, the acute being by far the most common.

Pathology.—Intussusception is the invagination of one portion of the intestine into another. Usually the upper part of the intestine into the lower, although the reverse is occasionally seen. From Nothnagel's experiments, we learn that there is first a contraction of a certain part of the intestines and if this occurs

abruptly the normal gut below this point turns upward and folds over upon the contracted portion above, forming a minute intussusception. When once begun the intussusception increases solely at the expense of the external layer.

An intussusception consists of three layers of bowel: the outermost or intussusciens; the middle or returning layer; and the internal or entering layer.

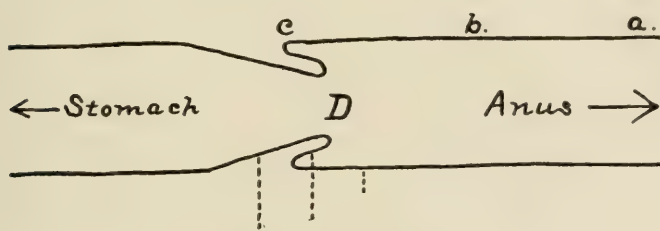


FIG. 1.

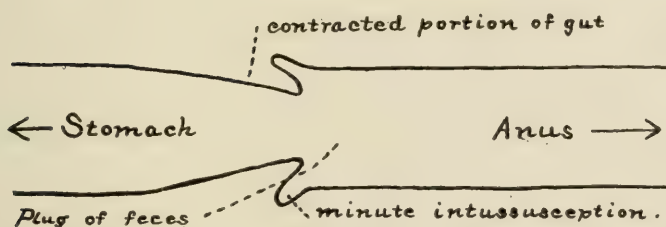


FIG. 2.

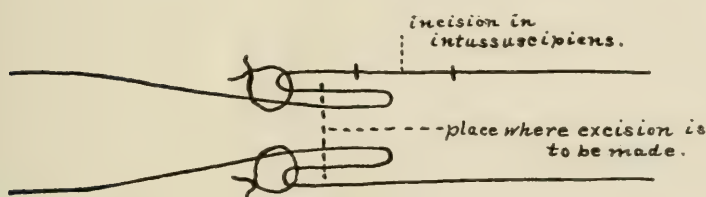


FIG. 3.

The amount of invagination varies from a few inches to several feet. Occasionally the ileocecal valve may be carried through the colon and rectum and present externally. As invagination takes place, the mesentery is drawn in with the bowel and lies between the entering or inner layer and the returning or outer layer. This is a potent factor in the treatment, for it is a well-known fact that, when two injured serous

surfaces come in contact, a layer of lymph is thrown out and within twelve hours adhesions form.

This fact is clearly demonstrated by the mere opening of the abdomen and handling of the intestines, however carefully, for a plastic peritonitis occurs in nearly every case.

Hence, if treatment is delayed too long, it may be impossible to reduce the intussusception without operation on account of these adhesions.

During the first few days, especially after the first day, there is considerable swelling at the apex of the intussusception, which renders reduction difficult or impossible. This swelling may often amount to 3 or 5 inches.

When death occurs early, as it may from shock, there is little to be seen except the invagination of the gut and congestion of the peritoneum and intestines with, perhaps, a thin layer of lymph.

In cases lasting a longer time, autopsy shows the affected bowel large and thick and forming an elongated tumor with a curved outline. The parts are congested and swollen, due to constriction of the vessels in the mesentery between the layers, and the entire mass is of a deep livid-red color.

The attachment of the mesentery leads to a sharp angulation of the area of invagination and this is the cause of the sausage-shaped tumor, which aids so materially in the diagnosis. The presence of the bloody discharge from the rectum is due to the intense engorgement resulting from compression of the mesenteric vessels between the inner and middle layers.

Should the patient survive without treatment, gangrene and sloughing of the invaginated portion may occur and if union has taken place between the inner and outer layers, the gut may be restored to its normal caliber and in this way a spontaneous cure be effected.

Osler cites the case of a lad who had symptoms of internal strangulation, and who, after passing 17 inches of small intestines, made a complete recovery.

Holt gives two cases in which the entire colon was passed, the patient recovering, but dying several months later from other causes. The autopsies in both of Holt's cases showed the ileum attached to the lower part of the rectum just above the anus. Gangrene and sloughing, if it occurs at all, is most likely to be seen around the end of the second week.

Symptoms.—The symptoms are striking and in acute cases

are so uniform that a diagnosis is comparatively easy. The patient, usually a child, is suddenly taken ill with severe pain and vomiting. The pain, colicky in type, occurs paroxysmally every few minutes, but later becomes continuous. It is one of the most severe pains of infancy and causes the child to shriek in anguish. The vomiting, projectile in type, consists at first only of stomach contents, but later it becomes a greenish, bile-stained material, and in some cases may even become fecal.

There is always constipation, which may be complete, obstipation. As a rule, the contents of bowel below the invagination is expelled either spontaneously or by enema, the feces being usually blood-stained. After this nothing is passed except blood and mucus.

In some cases the opening at the apex of intussusception may not be completely closed, and in these cases there is passed frequently gas and feces. There is usually intense tenesmus, especially if large intestine is involved.

The constitutional symptoms from the onset are severe, the general condition of the patient being that of collapse. The face becomes pallid and anxious, the temperature subnormal, the pulse rapid and thready or imperceptible, and the respirations superficial and shallow. The tongue is dry and parched, the thirst intense, and the skin covered with a cold, clammy sweat. There is extreme restlessness and convulsions may supervene. If the symptoms continue longer the signs of peritonitis are added; if so, there is a rise of temperature— $101-103^{\circ}$ F.; the pulse becomes tense and wiry— $100-104$; the patient lies motionless on back with legs and thighs flexed and the abdomen becomes tense and rigid; the rigidity being localized if peritonitis is local, and general if peritonitis is general.

Examination during the first day or two shows the abdomen soft and relaxed and a sausage-shaped tumor can usually be felt in the right iliac fossa.

On the second or third day the abdomen becomes distended, but if the invagination is high up the distention may be so slight as to go unnoticed.

In some cases the apex of the intussusception may be found protruding from the anus. Frequently we can see the exaggerated peristaltic waves run along the coils of intestine to the point of obstruction. The urine is high colored and scanty; in fact, it may be even suppressed if the obstruction is high up in the bowel.

The scanty urine is probably due to the constant vomiting and the small amount of liquid absorbed. The blood examination may show a leukocytosis of 75,000 to 80,000 per cm.; however, a high leukocyte count generally points to gangrene of the invaginated gut.

In the subacute varieties, the onset is less abrupt and the same symptoms are present, though less severe. In chronic cases, the onset is very gradual and the pain, vomit, and bloody discharge are usually wanting. Here often only the presence of the tumor, with the progressive wasting and perhaps diarrhea, leads to a correct diagnosis. The cardinal symptoms of acute intussusception may be summed up thus: The sudden onset, the pain, vomiting, bowel symptoms, and the tumor.

The *onset* in the vast majority of cases is very sudden, except in the subacute and chronic forms. The pain and vomit are the most frequent symptoms of the onset, but in a few cases the first thing noticed is a diarrhea or a bloody and mucous discharge from the anus.

Pain is of great severity and usually paroxysmal. Rarely is it continuous at the start, though it often becomes so during the second and third day. The pain is usually referred to the umbilicus and is most marked during the first two days. In chronic cases it is almost always absent.

Vomiting is most marked at the onset, but may continue severe throughout the attack. It is not so much a symptom of intussusception as it is of acute intestinal obstruction. The vomiting is projectile and uncontrollable. At first it consists of stomach contents, but soon it becomes greenish from the presence of bile and then, if obstruction to the intestines is complete, it becomes fecal. Fecal vomiting is not common in infancy, only 10 to 11 per cent. of cases under ten years having it. It is a bad sign, though not always a fatal one, and rarely seen before the third or fourth day. Vomiting is absent in chronic cases.

Bowel symptoms are very prominent. One of the most characteristic symptoms of acute intussusception are the bloody and mucous stools, present in three-fifths or more of all cases. The discharge of blood frequently follows the attacks of severe colicky pain. In some cases it is not discharged spontaneously, and only when an enema is given do we get any evidence of blood. The amount of blood passed each time varies from a mere trace in the mucus to an ounce. Constipation in acute

cases is usually complete, neither gas nor feces being passed. However, we usually get one or two watery stools after the onset, which is simply the contents of the bowel below the obstruction.

In some cases the opening at the apex of the intussusception may not be completely closed and in these cases we do not have complete constipation. Tenesmus is present in one-third of the cases and especially so if the tumor is in the large intestines. Tympanitic distention is also seen in one-third of the cases and occurs usually on the second or third day, the abdomen being usually soft and relaxed during the first day or two. The distention is especially marked if the lower bowel is involved, whereas if the invagination is high up in the small intestines it may be so slight as to go unnoticed. In those cases where the opening at the apex of the intussusception is not entirely obliterated the distention may not be marked, even though the obstruction is in the large bowel.

The tumor is one of the most diagnostic symptoms. It may be present as early as a few hours after the onset and in three-fourths of all cases it is found on the first day.

The tumor may be felt through the abdomen or in the rectum or in some cases it may be seen protruding from the anus. As felt through the abdomen it is sausage-shaped, especially if it is 5 inches or more in length. During pain or manipulation it becomes more prominent and often erectile.

As felt in the rectum, it resembles the os uteri, the opening in the apex corresponding to the cervical canal.

When protruding from the anus it is of a deep purplish color and may be gangrenous. This condition may be mistaken for hemorrhoids, prolapsed anus, or polypi.

The *diagnosis* is fairly easy in acute cases.

The sudden onset of severe colicky pains, projectile vomiting, absolute constipation, and the patient in a state of more or less well-marked collapse, are unmistakable symptoms of acute intestinal obstruction. If, with these symptoms, an elongated tumor is felt in the position of cecum or in the course of the colon, and if there is frequent tenesmus and a discharge of bloody mucus or even pure blood from the anus, the diagnosis of acute intussusception can be made. The diagnosis of acute intestinal obstruction is easily made, but the form of obstruction is not always easy. However, if symptoms of acute obstruction

occur in a child—especially under ten years—intussusception should first be thought of.

When vomiting sets in early, is frequently repeated and becomes quickly fecal, and the belly is uniformly and only moderately distended, and the excretion of urine small, the obstruction is in the small intestines.

When the vomiting sets in later, is less urgent and a longer interval elapses before it becomes fecal, and the abdomen is greatly distended and tenesmus marked, the obstruction is in the large intestines.

The *differential diagnosis* may be considered twofold, 1. from other forms of obstruction, and 2. from other abdominal disturbances not due to obstruction.

1. *Diagnosis from other forms of obstruction.*

External Hernia.—Here the patient shows a tumor, which is fixed to the body wall and is tense, painful, and tender, and gives an impulse on coughing and is found at one of the usual sites of hernias. The patient may have had a hernia which was reduced in a strangulated condition. Here there would be no external signs of a hernia and a diagnosis from intussusception would not be so easy. However, the patient would give a history of a rupture which was reduced, the reduction of which bearing a distinct relation to the onset of the symptoms of obstruction.

Internal Hernia, or Strangulation.—This usually is seen after twenty years. Here there is no tumor or swelling and the vomiting usually becomes fecal sooner than in intussusception. A history of previous attacks of abdominal pain or a previous peritonitis, appendicitis, or other abdominal inflammation may be elicited, and if present is suggestive of strangulation by a band. Here usually there is no sausage-shaped tumor and no bloody and mucous discharge.

Volvulus.—This is rarely seen in children and is rarely diagnosed. However, the usual site of a volvulus is in the sigmoid flexure, and if a rounded, tense tumor can be felt in the left iliac fossa or flank associated with marked general distention, coming on some time after onset of symptoms, a diagnosis of volvulus could possibly be made. However, an intussusception of the colon in that region would have to be differentiated from volvulus. The presence or absence of a sausage-shaped tumor and bloody and mucous stools would decide which of the two was present.

Fecal Obstruction.—Here the feces can usually be felt in the

rectum and the patient gives a history of constipation for some months or years. This could hardly be confounded with acute intussusception, but may be with chronic intussusception.

However, the presence of a sausage-shaped tumor would be suggestive of chronic intussusception.

In obstruction due to gall-stones a history of pain in hepatic region and perhaps jaundice and previous attacks of biliary colic may be elicited.

2. *Diagnosis from other conditions, not obstructions.*

Acute Enteritis.—In this disease we always have a fever and diarrhea with mucous and blood. Intractable constipation, fecal vomiting, distention of the abdomen and the tumor, symptoms so prominent in acute intussusception are usually absent.

However, very severe cases of enteritis with vomiting, intestinal paresis, causing tympany and constipation, are difficult to diagnose from intussusception.

The sudden onset with colicky pain and vomiting does not occur in enteritis as in intussusception.

The sausage-shaped tumor is also absent in enteritis.

Appendicitis.—This may result in a peritonitis and if this be severe and diffuse a diagnosis is often difficult.

In appendicitis there is an initial rise of temperature, the vomiting is never fecal, and tenderness is marked at McBurney's point.

Acute Hemorrhagic Pancreatitis.—In this condition there is a sudden, violent, deep-seated pain in the epigastrium followed by vomiting and collapse and swelling in the epigastric region.

There is no fecal vomiting, obstipation, or exaggerated peristaltic waves along coils of intestines as you get in intussusception. The pain is not colicky in acute pancreatitis and the sausage-shaped tumor and bloody and mucous discharges are absent.

Hepatic Colic.—Here there is an excruciating, cutting pain, usually in the right hypochondriac region which may spread over abdomen and lower thorax and in some cases be referred to right shoulder and forearm. Jaundice is present in one-half of the cases.

Complete constipation, mucous and bloody discharges, and the sausage-shaped tumor, found in acute intussusception, are absent.

Renal Colic.—The pain here runs from the lumbar region to

the bladder. It comes on suddenly and ceases just as suddenly when the stone drops into the bladder. Blood is found in the urine after the attack. Constipation, mucous and bloody discharges, and the sausage-shaped tumor are absent.

Prognosis.—The condition is always grave. It depends largely upon the age of the patient and upon the time when proper treatment is commenced. Under one year of age the prognosis is absolutely bad, but with each succeeding year it becomes a little better. In cases reported by Pilz the mortality under one year was 59 per cent., while in patients from one to ten years it was 46 per cent.

The cases giving the best prognosis are those in which treatment is commenced on the first or second day. If treatment is delayed, with each succeeding day the prognosis becomes worse. In former years recovery was rare, except in cases of sloughing. In 1870, according to Pilz, the mortality in cases between one and ten years was 68 per cent., while from 1873 to 1891, this figure was reduced to 46 per cent.

Since 1891, the mortality has been still further reduced, for the profession now recognizes that few lives need be lost from intussusception if they are diagnosed and treated early.

Treatment.—The treatment is divided into medical, dietetic, and surgical.

a. Medical Treatment.—The first indications are to withhold food from the stomach and to administer opiates by hypo. to diminish the peristaltic waves above obstruction. Cathartics are absolutely to be condemned, for they increase the intussusception.

To allay the distressing vomiting the stomach should be washed out. This may be practised three or four times a day with beneficial results and, in fact, cures have been effected, probably by lessening distention and peristalsis and thereby favoring spontaneous reduction.

Kussmand claims that not only does lavage comfort the patient, but it also relieves the abdominal distension, the pressure in bowel above seat of obstruction and lessens the violent peristalsis.

For the tympanitic distention, if present, turpentine stupes and hot applications may be applied to abdomen and, if extreme, the bowel may be punctured with a small aspirating needle. However, reduction should be effected before marked distention. After administering the opium, reduction should be tried by injection of fluids or inflation.

According to Holt, there is no advantage of either of these methods over each other.

Injection of Fluids.—A saline solution, milk and water, or gruel, may be used. Formerly, mercury was used by many. The fluid should be from 100–105° F. for the relaxing effect. It is then placed in a fountain syringe, suspended four or five feet above the patient's head. The injection should be made through a catheter and the fluids should be prevented from escaping from the rectum by pressing the buttocks tightly together. From time to time the patient should be inverted.

Kneading of the abdomen in region of tumor often aids in the reduction, especially if practised while the patient is inverted. After fifteen or twenty minutes the fluid is allowed to escape and the abdomen examined.

Inflation.—This is the simplest, safest, and most efficient method. Before insufflation the colon should be thoroughly washed with a high enema by Hegar's method, in which an enema nozzle, connected with a funnel by a rubber tube about 2 feet long, is inserted in the rectum. Warm water is then poured into the funnel and the rectum and colon filled with 2 to 4 quarts of water. This should be done without an anesthetic, so that pain may be a warning signal to stop. After allowing the water to pass from the rectum the patient should be anesthetized and put nearly or completely in the inverted position.

For inflation, an ordinary hand bellows with a catheter attached is the best apparatus. The catheter is inserted into the rectum and the air is prevented from escaping by pressing the buttocks tightly together.

The best guide to amount of air introduced is the tension of the abdominal walls. A trial of this method should occupy fifteen to twenty minutes. The air is then allowed to escape and the abdomen examined while the patient is still under the influence of the anesthetic.

It is difficult to know whether you have succeeded or not. Sometimes the tumor may have disappeared, but still a small amount of invagination remains which cannot be felt.

If you can feel no tumor, the best method of learning whether a reduction has been effected or not is by the general symptoms. If there is no improvement in the pulse or temperature and the vomiting continues and marked constipation is still present, some invagination still exists.

Reduction by injection of fluids or inflation can only be

secured if used early, that is before adhesions form and before the swelling becomes too marked.

These methods should, therefore, be tried as soon as a diagnosis is made or where invagination is suspected.

The dangers are rupture of the intestines and the fact that you do not know, for a certainty, if gut is gangrenous or not; if it were gangrenous it would be fatal, if reduced.

Rupture, however, is a rare accident, for out of a series of 225 collected cases in children and including nearly all those reported between 1870 and 1891, Holt states that rupture has been recorded only once.

b. Dietetic Treatment.—This is important. Food should absolutely be withheld from the stomach. If any food be taken it decomposes, causing autointoxication; even drink may excite severe vomiting. The patient should be nourished by the rectum, and thirst may be relieved by injection of a pint of lukewarm water, with a teaspoonful of salt dissolved in it, into the rectum. If rectum is too irritable one or two pints of a salt solution of above strength may be injected into the cellular tissue beneath the skin. Should the patient become weak and the heart action embarrassed, one-half or more ounces of whiskey should be given from time to time, weakened by two or three times the quantity of salt solution given either by the rectum or injected into cellular tissue. After reduction has been accomplished the diet should be slowly increased, giving only fluid nourishment by mouth for two or three days or until all symptoms have subsided. The fluid food should consist of beef juice, broths, egg albumen, and simple farinaceous gruels. Milk, if not wholly absorbed, forms too bulky feces and should be eliminated from the diet for a few days. Often-times, with poor feeding symptoms of profound collapse come on and you think that invagination has recurred. But this depends on the sapræmic intoxication from toxins produced by decomposed food, a fact which is proved by the prompt relief which follows the emptying of bowel by lavage and irrigation.

c. Surgical Treatment.—Is indicated after negative results with injections or inflation. In very acute cases the operation should not be delayed an hour after such failure is evident. The earlier laparotomy is done the better the chances of recovery. According to statistics, the mortality where laparotomy was done during the first twelve hours was 14 per cent.; during the second

twelve hours, 35 per cent.; and during the third twelve hours, 44 per cent. These figures clearly prove the value of an early operation. In fact, even after you think you have effected a reduction by inflation or injection and the child does not improve according to your desire, it is well to consider laparotomy, for the facts that you may have reduced a gangrenous portion of gut or that the reduction may not have been complete should ever be kept in mind. In recent cases the edematous condition of the intussusception is the difficulty encountered in reduction. To overcome this, the invaginated gut should be firmly compressed between both hands of the operator before attempting to reduce. One hand then grasps bowel above and the other hand below the obstruction. Traction is then applied, so that while the apex is forced in an upward direction the intussusciens is at the same time drawn in a downward direction.

Reduction may be assisted by rectal inflation, or the gas below intussusception may be pressed against it by contracting gut with hand.

Cases in which operation has been delayed for a day or more generally show considerable adhesions. These may be separated by inserting and passing a probe around bowel.

Should reduction fail, either of the following may be tried:

1. Formation of an anastomosis between the bowel above and below the intussusception.
2. Resection of the apex of the intussusception.
3. Formation of an artificial anus.

The formation of an anastomosis between bowel above and below obstruction is indicated where there is gangrene of the intussusciens.

Resection of the apex of the intussusception is indicated where there are marked adhesions preventing reduction or where there is gangrene of the apex with no gangrene of the intussusciens. A longitudinal incision is made in the intussusciens about $1\frac{1}{2}$ inches long and the entire gut within the intussusciens is excised with cautery near its base.

Interrupted or a continuous catgut suture is then applied, passing through the three layers, and the incision made to resect apex is closed.

The formation of an artificial anus is indicated where the intussusception is too long or where the condition of the patient does not permit of resection of the intussusceptum or anastomosis.

Of course, if the obstruction is high up in the small intestines, the formation of an artificial anus is of little use, for the patient will pass the food through the opening before there has been time for absorption.

It is especially useful where the patient is too weak to permit of anastomosis, the artificial anus being only palliative until patient becomes stronger, when an anastomosis can be made.

456 SECOND STREET.

ETAPPEN TREATMENT OF BOW-LEGS AND KNOCK-KNEES.*

BY

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(With six illustrations.)

IN October, 1909, before the Harlem Medical Society, I read a preliminary report on this method of treatment. At the time, in the course of discussion, the question arose whether or not too much was said about the treatment of knock-knee and bow-legs, as they were so often autocorrecting. There is no doubt that in the ordinary slight distortions, usually nonrachitic in origin, manipulation and the raising of the soles of the shoes to produce the opposite gait are sufficient to overcome the irregularity. But when the bending has become more pronounced such can hardly be expected to hold good, and only consistent corrective effort, combined with the necessary general medication and diet, can overcome the condition. In these cases several methods of treatment have been employed. They are:

1. Treatment with braces.
2. Operative correction and plaster-of-Paris retention, either by means of osteotomy or osteoclasis.
3. Putting the legs up in plaster and correcting the distortion with manual pressure until it has set.
4. The procedure I wish herewith to describe, combining the plaster-of-Paris bandage with corrective wedging.

Of these the treatment with braces and operative correction have been most frequently described, and are too generally known to need any explanation. The shortcoming of the brace treat-

* Read before the Medical Association of the Greater City of New York (Nassau), April 4, 1910.

ment is that it is expensive, that the parents become careless and bring the child for observation only at long intervals, and that the brace is frequently removed by them at home thus losing its necessarily continuous effect. The operative correction is naturally curative if efficiently done. But for its satisfactory execution much experience is required, and it can hardly be recommended to the physician for general use. Again, as I have experienced in my clinics, the laity have a horror of anesthetics and opera-



FIG. 1. Figs. 1, 2, 3, represent types of cases under treatment.

tions, and many children are allowed to go on distorted rather than expose them to the—usually imaginary—dangers attendant thereto.

This led me to use plaster of Paris more generally, but I soon found that the uninterrupted bandage with manipulation, even though often repeated with increased correction, was very slow in effect. And in the older, firm, more pronounced cases practically no result could be obtained by this method.

Such experience made me look around for some other mode of procedure, and I decided upon plaster-of-Paris splinting combined with corrective wedging. The idea is not original in a sense, Dr. Sayre, of New York, having used it years ago and Dr. Wolff, of Berlin, having described it, basing the method of treatment upon his law of bone construction and external conformation relative to its—by nature or force—continuous function. The difference



FIG. 2.

in my cases has been that I have eliminated any anesthetic and that only a portion of the splint has been divided.

The relegation of this method of treatment to secondary—nearly forgotten—importance is peculiar when one considers its usefulness, for I have found it to be very effective.

In the less marked distortions correction by this means meets with no difficulty, and even in the very pronounced ones of the age of five or six years, where eburnation has practically taken

place, the force one can apply at each progressive correction is great enough to overcome all bony and ligamentous resistance. In fact, the older cases, although somewhat slower to respond, are more consistently satisfactory than the pliable limbs of the very young, for the correction in the former is fully maintained after the bandage is removed.

The tracings herewith submitted and explained should show some of the results obtained.

The process of treatment is the following:



FIG. 3.

The distorted legs from the base of the toes upward—generally well up into the thighs—are encased in thin cotton wadding as snugly as possible, bony prominences and the points of pressure in addition being protected by felt or cotton squares. On this the plaster-of-Paris bandages are applied to the desired thickness, the assistant meanwhile holding the foot slightly everted in bow-legs, inverted in the knock-knee cases, this attitude to remain patent when the splint has hardened; and the foot and knee-joint are held as nearly as possible in a straight antero-

posterior plane. The bandage, when finished, is about one-eighth to one-quarter of an inch thick and should hold the foot at right-angle flexion to the leg and the knee extended. It reaches up on the thigh as high as the condition demands, higher naturally in knock-knee or complete bow-leg than in the tibial type of bow-leg. In this latter class the bandage later on in treatment, as improvement takes place, does not need to



FIG. 4. Result of treatment shown in Fig. 5.

include the knee and thigh, but in all cases up to the end of treatment the foot must remain encased.

As soon as the plaster of Paris has set, a transverse incision is made in it extending over one-half of its circumference and penetrating its entire thickness opposite to the point of greatest deformity and on the concave aspect of the same. Thus in bow-leg the incision is made on the inner half of the splint, in knock-knee on the outer, extending in either from midway behind to midway in front. Thereupon the plaster is allowed to

harden fully, which takes about fifteen minutes, when manual correction of the deformity is undertaken in the following manner: placing the leg either over the knee, the edge of the table or a wooden block, with the undivided side of the bandage resting upon this, the latter is grasped above and below the incision and moderate, corrective pressure is exerted. As this is done, the undivided half of the splint acting as a hinge, the edges of the incised half separate. The pressure is continued until sufficient correction has been produced, which at first is comparatively slight; a wooden wedge to fit the separation is then quickly

TRACING/July 2, '09. TRACING/Sept. 29 '09.
TRACING/March 20 '10. (Discharged).



FIG. 5. Showing results of treatment.

TRACING/June 18 '09. TRACING/Sept. 13 '09.
TRACING/Dec. 1 '09. (Discharged).

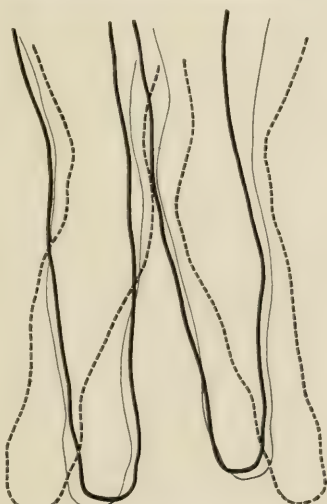


FIG. 6. Showing results of treatment in case of knock-knee.

prepared and placed between its gaping edges. The rest of the opening is filled up with cotton, any irregularities in the undivided half are hammered out, and a few turns of a plaster-of-Paris bandage are taken covering the spot to hold the wedge in position.

The first corrective stage is maintained during a period of about two weeks; then the plaster shell covering the wedge is cut away, the latter removed, greater correction is produced and a larger wedge inserted, and this is repeated at about the same intervals. Between treatments the child is permitted to walk and play around as much as it likes. This, of course, soils the

splint and wears out the foot portion rather soon, so that the entire plaster dressing has to be changed about every five to six weeks.

This corrective treatment must, if possible, be exercised faithfully and without intermission until the distortions have been fully overcome; which covers a period of about two to six months. Should pressure sores occur, which rarely happens, they are easily detected as the children complain of pain—which they otherwise never do—and by the odor. In such case, of course, they must be healed before another corrective splint is applied. At first the children cry while the manipulation takes place, probably from fear as well as pain, but they forget this immediately and suffer no discomfort while wearing the plaster and do not complain with the next and following corrections. I have not observed one, even with the first dressing, unable to walk comfortably shortly after the treatment.

After the distortions have been fully overcome occasional supervision is indicated to keep the case under control, and massage to further reconstruction is advised.

As to the final results, they appear excellent. There is practically no atrophy, the legs lengthen perceptibly, the muscles remain firm and active. In no case have I observed any stiffness of the ankle-joint nor laxity of the knee-joint following the course of corrective treatment upon removing the bandage. There is no chance of undue callus formation, such as may follow osteotomy, with consequent interference to the circulation or nerve activity, for there has been no separation; and the distortion has been corrected in its entirety as well as at the point of greatest deviation. The twisting coincident to the deformity (outward rotation of the leg upon the femur in knock-knee, inward in bow-leg) is reduced simultaneously by our efforts and by the law of adaptation: nature assisted working out its own salvation. This twisting is one of the most annoying complications of the distortion, and unless overcome during operation makes this procedure, although the bones are made apparently straight, frequently unsatisfactory and incomplete. In no case has this corrective procedure met with undue difficulty; the leverage is so great that all resistance can in time be overcome; anterior bow-legs have given us the most trouble on account of the low location of the distortion.

The disadvantages of plaster-of-Paris treatment with corrective wedging may be cited as:

1. The increased work attendant thereto.
2. The somewhat long period of treatment.

The advantages are:

1. Its cheapness.
2. Its simplicity and ease of application.
3. The absolute control over the progressive correction.
4. The absence of any dangers, such as those of the anæsthetic, possibility of infection (as in osteotomy), malunion of bones or formation of undue callus at the seat of fracture.

5. The untwisting of the straightened legs.

2 WEST EIGHTY-SIXTH STREET, NEW YORK.

CLUB-FOOT AND MANIPULATIVE TREATMENT OF THE CONGENITAL TYPE.

BY

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THE four simple varieties of club-foot are:

1. Talipes equinus; extending on plantar flexed foot. Patient walks upon heads of metacarpal bones with the heel elevated.
2. Talipes calcaneus; dorsal flexed foot. Patient walks upon os calcis, toes elevated.
3. Talipes varus; inverted foot. In this variety the foot is abducted, inner border of the sole is elevated, and the outer border depressed so that the weight falls to the outer side of the center of the foot.
4. Talipes valgus; everted foot; this is the reverse of varus. The foot is abducted and sole everted so that the weight falls on the inner border of the foot.

The compound varieties are more common, and are as follows;

1. Talipes equinovarus—the extended and inverted foot.
2. Talipes equinovalgus—the extended and everted foot.
3. Talipes calcaneo-varus—the flexed and inverted foot.
4. Calcaneo-valgus—the flexed and everted foot.

Club-foot may be: 1. Congenital—grown into deformity before birth.

2. Acquired—perfect at birth, but at a later date distorted, because of a. paralysis of groups of muscles by anterior poliomyelitis (83 per cent.). b. Cerebral paralysis (12 per cent.) either congenital, due to maldevelopment; or acquired, due to

hemorrhage, embolism, thrombosis, or to disease. c. Local causes (5 per cent.), as traumatism to nerve trunk, contraction of a scar after severe burn or direct injury.

3. Non-deforming—not very often recognized and rather uncommon.

Congenital Talipes: Etiology.—Inheritance may be considered, and its influence is sometimes apparent. The most reasonable explanation is the mechanical, due to remaining in a constrained or fixed position *in utero*. This may be due to interlocking of the feet, or to direct pressure from intrauterine or extrauterine tumors, or, possibly, entanglement in the cord may account for the deformity. This form of talipes may be combined with evidence of impaired or arrested development, as harelip, exstrophy of the bladder, spina bifida, and absence of patella. (The writer has seen two cases of double congenital talipes in combination with double dislocation of hips, and in one of these cases there was also a posterior luxation of both knees.)

It seems to be most common among males. About 43 per cent. of the cases are double; 31 per cent. are in the right foot and 26 per cent. in the left foot.

The ordinary type of congenital club-foot is the equinovarus. With it there is at times a moderate degree of knock-knee, and the tibia may be twisted on its axis.

The position of the foot in early infancy is an exaggerated attitude of plantar flexion, adduction, and supination. The internal structure of the foot is rearranged to correspond to the external contour, thus the relation of bones to one another, and even the shape of the individual bones is more or less altered as the deformity is more or less of an exaggeration of the attitudes that the normal foot is capable of assuming. Changes are most marked in the astragalus and the os calcis.

Anatomy.—In all cases of congenital club-foot, the scaphoid bone will be found articulating with the side of the head of the astragalus rather than with the anterior surface. The articulation is more toward the under side of the astragalus, leaving the head uncovered. The scaphoid may be distorted so as to articulate at one end with the tip of the internal malleolus. The tarsal bones are not in their normal position. The cuneiform bones follow the displacement of the scaphoid, also the metatarsals and phalanges, so that the long axis of the forefoot forms a right angle, or even an acute angle, with the axis of the leg.

In fully developed cases, in adults or older children, the altera-

tions in position and shape are most noticeable in the os calcis, cuboid, astragalus, and scaphoid.

The os calcis is drawn from a horizontal to a vertical position, or approaching it, also rotated more or less on its vertical axis, so that its anterior extremity is directed outward and posterior inward and thus the anterior articulating facet is oblique to the axis of the bone. The cuboid maintains its connection with the os calcis but follows the inward direction of the anterior extremity of the foot.

The astragalus is so rotated that only the posterior portion of the superior articular surface is in contact with the inferior articular surface of the tibia, and the anterior part of its anterior facet projects beneath the skin of the dorsum of the foot. The shape of the bone is also altered by the twisting inward of the head and neck, so that the anterior articular surface looks inward instead of forward.

In congenital club-foot there is no paralysis of the muscles, but the contracted muscles seem more developed than the lengthened muscles. The muscles of the leg atrophy from disuse, and the leg is much smaller and the foot shorter than normal.

Grades of Deformity.—1. When the foot can be brought nearly into a normal position by manipulation with the hand.

2. When the axis of the foot can be brought into the line of the axis of the leg, but the foot cannot be brought to a right angle.

3. When little alteration can be made by manual manipulation of the foot.

Treatment.—"Just as the twig is bent the tree's inclined." The best time to treat congenital club-foot is before the weight of the body interposes its mischievous influence. In the plastic and formative stage of the new-born child the misshapen structures are sure to yield, no matter how rigid and unpromising they seem to be on first examination, to the gentle and firm pressure of continuous leverage. Each added month makes a congenitally deformed foot, if neglected, more obstinate. If over-correction is not secured by the time the baby begins to walk, it is time to find out whom to blame, the physicians, or the parents, for failure to follow instructions, or to bring the case to the attention of the physician often enough. The main object seems to be to keep the feet as nearly as practicable to their natural appearance, or overcorrected, and nature will do the rest. The means employed depend upon the physician, and the emergency of the case. The difficulties of treatment are increased

when the child begins to walk, when the problem presented is how to make the patient strike the ground with his feet at such an angle that he will stamp his feet straight instead of crooked. Growth is a prime consideration as it adds increasing weight and activity, which if directed will promote recovery in the most effective way, or if neglected will surely lead to resistant and inveterate deformity.

A club-foot treated in infancy may be perfectly cured both in function and in form. A club-foot treated later on in childhood will leave behind a certain amount of atrophy. No other deformity presents such a record of failures and incomplete cures, of relapses after apparent cures, of tedious and ineffective treatment by braces, and of unnecessary and mutilating operations.

In our choice of mechanical appliances to hold the foot in its overcorrected position, as reached in the first manipulations, we select the plaster bandage. In using the plaster great care must be taken to avoid undue pressure, irritation of the skin, or insecurity of the bandage. The advantage of the retention of the foot by the plaster is very marked, especially in the fact that the muscles on the back and inner side of the leg of an infant are relatively hypertrophied as compared with those on the front and outer side that are disused, so that by limiting all action the harmful effects of the muscular activity of the foot are counteracted.

The first plaster should be put on very thin, when the child is two or three weeks old, preceded by preliminary manipulation by the nurse, and the deformity corrected slightly—as far as possible toward the abducted position without causing discomfort. This dressing is removed at the end of a week and the same process gone through with until at the end of four or five weekly applications the foot can be held in the attitude of extreme equinovalgus.

So far we have only treated the varus condition, now we must turn to the equinus. In this, force is needed to stretch the tendo achillis, and care must be used in manipulating, that the os calcis is really drawn downward by a lengthening of the tendo achillis, and not that the forefoot is overcorrected. The reduction of the equinus may be more difficult, but should be entirely corrected in three or four months. The advantages of the plaster over mechanical appliances, such as braces and splints, are numberless, but the principal one is the fact that the plaster is entirely under control of the surgeon, and no meddling can interfere with the treatment, whereas in the case of a brace

or splint, it is very easy to loosen a strap or change a bandage under the mistaken idea that the brace hurts the child's leg.

In some cases it may be necessary to do a tenotomy or tendon lengthening on the tendo achillis, which is the most resistant of the shortened tissue. When the foot has been forced into position it is retained for several weeks to allow the interval between the separated ends of the tendon to fill in with the new tissue.

In older children the deformity may be corrected rapidly but the same principle applies. The deformity must be overcorrected and retained there until the immediate tendency toward deformity has been overcome. The patient may be anesthetized, and using one hand as a fulcrum on the affected foot with the palmar surface resting on the os calcis and cuboid, the other hand acts as a lever with the forefoot, exerting alternate pressure and relaxation against the first one, stretching all resistant structures. Under this steady manipulation the foot soon loses its rigidity and its elastic recoil toward deformity. It may even be necessary to lengthen the tendo achillis to help matters. The foot after overcorrection is put up and retained in plaster, this plaster coming above the knee, and, being rather heavy, the patient is allowed up the next day and encouraged to use the leg. The plaster is changed at the end of four weeks, and left on for varying periods of six weeks to six months. In most instances the plaster is replaced at the end of three months by a simple leg brace worn inside the shoe and with a calf band. Now the second stage of treatment is begun, consisting of massage of the foot and leg to stimulate the growth of the atrophied muscles and methodical manipulation of the foot several times a day. This stage of the treatment is very important and must be under the supervision of the surgeon.

Forcible manual correction may be employed with advantage in children from two to ten years of age.

According to Mr. Little of Liverpool, who has tried Phelps' operation in some thirty-seven instances, the classes of cases suitable for it are:

1. Those of such severe deformity that careful and persistent treatment by milder methods has failed to effect a cure, or "cases of necessity."

2. Those, chiefly in hospital practice, which owing to poverty or indifference are neglected as regards aftertreatment. He performs it as follows:

Make a V-shaped incision with base toward the outer border

of the foot and the apex over the tuberosity of the scaphoid. Everything is divided except vessels and nerves. Occasionally he divides the neck of the astragalus. Tendo achillis is then cut and the flap laid across the wound and held in place by silkworm-gut sutures. Put in a board splint for a day or two, and then skin-graft the granulating area. Put in best position attainable in plaster of Paris. The operation is contraindicated because of the difficulty of predicting what the ultimate results of growth and pressure may be, and the danger of severe flat-foot following.

320 WEST EIGHTY-FOURTH STREET.

THE COMPLICATIONS AND SEQUELÆ OF DIPHTHERIA IN CHILDREN.*

BY

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WE are subjected to periodic outbreaks of forms of contagious diseases in which for the time being they seem to assume especially virulent characteristics on the one hand, or, if less virulent than the average type, their epidemicity is so extensive as to excite unusual attention. An example of the latter characteristic was well seen in the epidemic of measles which raged with unusual severity in this city during the winter and spring of last year, when the nonimmune population succumbed in large numbers to the contagium of this malady, and in consequence justified a prediction that this particular disease would claim but few victims for several seasons.

The present fall and winter has witnessed an increase in the ravages of both diphtheria and scarlet fever, and I have been impressed with the virulence of several cases of the former which have come under my observation and have been tempted to present this subject for discussion because of that fact.

It is very probable that we see almost as many complications and sequelæ of diphtheria now as were noted in the preantitoxin days. I would not be understood as claiming that antitoxin had not diminished the actual occurrence of complications in early and well-treated cases, but rather that the administration of this remedy has saved many severe cases of diphtheria which have later developed complications and sequelæ. It is too well known to need repetition here that much of the abuse and criti-

* Read before the Washington Obstetrical and Gynecological Society, January 21, 1910.

cism of the antitoxin treatment had its genesis in the fact that the conditions we are considering *did* occur notwithstanding its use, and occurred in such apparent severity that the odium of cause and effect was seized upon by serum opponents with great avidity. Experience has shown the fallacy of their arguments in attributing baneful results to a form of treatment that had made disastrous sequelæ possible, by prolonging the life of the unfortunate victims, but the saving grace of which had been overlooked in the bias of ignorant antagonism.

So terrible are the accidents which arise in the course of diphtheria, so insidious in origin, and so sternly progressive to a fatal dissolution that they may well be looked upon with concern and viewed with an apprehension sufficiently in keeping with their grave import.

During the past several months the cases that have come under my care have shown a marked tendency to the development of complications and sequelæ and in not a few these latter have progressed speedily to a fatal termination. This has been particularly true in hospital cases which is perhaps partly explicable because of the malignant types which are in my experience more apt to be encountered in ward work, and, furthermore, that in many instances such cases go untreated until their reception in the wards.

Not rarely does one see the victim of diphtheria overwhelmed from the outset by a malignant toxemia which consumes the spark of life in so short a time that an early death precludes a tardy, stormy convalescence nor permits the slow gradations of a lingering decay. In cases of this nature, however, if heroic serum treatment has for a time assuaged the ravages of the disease, complications are almost inevitable and the convalescence of such should be watched with extreme concern and guarded prognostics.

For purposes of general classification the complications and sequelæ may be considered as 1, those of a local nature, and 2, those of a general character.

It is hard to draw the line between lesions which may be looked upon as those incident to the ordinary run of diphtheritic cases and those which represent more malignant types of infection where the pathological results of the original invasion shade off into other diseased states which should rightly be called "complications." It is rather unusual in the present day to find the extensive membranous formation so frequently seen in

the preantitoxin era. There are instances, however, in cases representing severe infections or in badly treated patients where the membrane spreads upward to the nasal cavities in which it can even be seen by an inspection of the anterior nares and where the downward trend has embraced the larynx, trachea, and bronchi even beyond the fifth bifurcations.

I have seen diphtheria of the buccal cavity in a few instances, and in some of these cases I am firmly convinced that the extensive spread of membrane was made possible or at least aggravated by the use of hydrogen peroxide solutions in the throat and mouth.

Extensive adenopathy of the cervical lymph nodes is a complication not infrequently seen. Moderate enlargement of these structures is only symptomatic but instances are encountered where the infection is so virulent and the consequent inflammatory reaction so marked that the occurrence of this complication overshadows the rest of the picture and in my own experience warrants the gravest prognosis.

According to Councilman, Mallory, and Pearce this adenitis is the direct result of the diphtheria toxins, as they were unable to find organisms of any description in the glands examined. It is frequently stated that suppuration is rare in these cases, but we are frequently obliged to use surgical measures in the wards in Providence Hospital Annex.

An illustrative case is that of Harry S., aged four years, who on admission presented a picture of severe infection with such marked adenopathy that his small neck had the appearance of being surrounded by a brawny collar. The appearance of the neck somewhat improved on the succeeding day or two under the influence of repeated injections of antitoxin of 3,000, 7,000, and 3,000 units; but the induration and superficial redness persisting, an incision was made through the brawny tissues of the neck and a couple of drams of thick pus liberated. The incision drained well during the succeeding days of his illness, with considerable subsidence in the local symptoms, but the margins of the wound were foul-looking and almost necrotic. Death eventually resulted from toxemia.

In the digestive tract actual diphtheria of the esophagus and stomach have been described, but these are extremely rare complications.

Vomiting of repeated recurrence and of sufficient severity to endanger life is occasionally seen and diarrhea with final

collapse has occurred in a number of cases under my notice. During the fall of last year I had under my care an infant of one year with diphtheria of the eye in which a severe and protracted enteritis came very nearly being fatal, and no doubt so reduced the vitality of the little sufferer that the disease of the eye was enabled to make such extensive inroads upon this organ as to result in its loss.

There is one particular symptom in connection with digestive disturbances that should merit more than passing notice. I refer to late vomiting which occurs even when convalescence seems established.

Late vomiting most frequently is the initial symptom of some serious complication and should immediately put one on his guard.

Frequently it means a beginning nephritis, as in a case which I shall report later, or it may be symptomatic of serious cardiac mischief in which it is to be looked upon as a sign of the gravest prognostic value. Personally, I have never seen a cardiac case recover in which vomiting had been noted in connection with symptoms of heart paralysis, for if we consider this symptom to be indicative of pneumogastric involvement, the nature of its importance is at once apparent.

While diphtheria of the larynx is a part and parcel of the malady, yet laryngeal stenosis may be viewed in the light of a complication and a serious one at that. Not infrequently cases of moderate stenosis may be tided over by bold serum treatment and thus be saved from the necessity of intubation, but unfortunately so many of these cases show such rapid and complete obstruction that tubing must be early resorted to. There are but one or two points in connection with the question of laryngeal stenosis that I would like to emphasize, for the symptomatology of this condition is too well recognized to need especial mention.

I believe that it is not generally appreciated that a very great reduction in the caliber of the larynx may and does occur before very marked signs of respiratory distress appear. This fact will account for the not rare cases in which quite suddenly most alarming symptoms of suffocation appear often at a moment of unpreparedness. One should not fail to remember that but a fraction of an inch in caliber stands between the victim and total obstruction.

In the second place, there should seem but little need to emphasize the importance of watching the fluctuations of the

intrapulmonic pressure as the most certain guide to the necessity of intubation.

Bronchopneumonia seems about on a par with cardiac involvement in causing a fatal issue. It is surprising to note the number of mixed infections that have been found on autopsy and the variety of organisms that are responsible for this complication. In the table of the American Pediatric Society bronchopneumonia occurred in 5.9 per cent. of cases, fortunately a very small percentage. Lobar pneumonia appears to be very rare, while more common are lesions in the pleural sac, sero-fibrinous pleurisy, and empyema.

It is in the circulatory system that the most serious and fatal of the complications and sequelæ are to be met with. Diphtheria induces profound changes in the blood, the most constant of which is a hyperleukocytosis beginning early in the course of the disease and being further heightened by the occurrence of complications. Occasionally a severe grade of anemia is encountered which lasts late into convalescence and retards recovery. Baginsky has described as the result of his observations an increased coagulability of the blood which may give rise to the formation of thrombi within the vessels and even within the heart itself, and this factor must not be overlooked in its relation to the causation of sudden death which is so frequently seen in the course of diphtheria.

By far the most serious and fatal complications met with in the circulatory apparatus are those which have reference to the heart itself. Cardiac failure may be pronounced from the onset of the disease when the heart shares with other organs the intense poisoning of the disease toxins. It is of exceedingly unfavorable omen to witness this early cardiac depression, for in most cases it is but the precursor of circulatory embarrassment to supervene at a later day.

There is considerable literature available concerning the nature of the degenerations found in the heart muscle. Degeneration of the muscle fibers with occasional vacuolation was the most common lesion found by Romberg. Both ventricles may be hypertrophied and dilated, and a number of observers have noted a predominance of lesions in the right heart. The degenerations of the muscular fibrillæ are fatty or albuminous, rarely hyaline, and in some instances the transverse striations have been poorly marked or absent. According to Councilman and co-workers, myocardial degeneration is one of the most common

conditions found in diphtheria. Fragmentation and fracture of the diseased fibers has been frequently seen.

The endocardium and pericardial investment occasionally suffers as well, and heart thrombi due to the primary necrosis of the endocardium is not uncommon. There is less unanimity among pathologists in the findings of autopsy concerning the cardiac ganglia and the nervous network between the heart and the central nervous system. Vincent has described lesions of the cardiac plexus consisting of a parenchymatous and atrophic neuritis in a case dying of diphtheria. Bolton (quoted from Porter) has examined the medullas from eleven cases, and in all of them found the neuron cells of the vagus nuclei in a condition of granular degeneration, and he attributes the slow pulse to vagus stimulation that follows the irritation which this degenerative process sets up. Porter, *Arch. Ped.*, Aug., 1909, states that the fact that atropin, which inhibits the vagus, frequently restores the rapidity of these slow hearts, supports Bolton's findings, and the further fact that in all such cases which died the pulse rate was markedly increased before the fatal issue, suggests that the stimulation of the vagus had gone on to the point of overwhelming action and paralysis, and that the heart, with its vagus control abolished, had raced itself out.

I believe this field of research will yield most interesting results, even though it can never be clearly established which factor, the myogenic or the neurogenic, is primarily responsible for heart failure in diphtheria. There are certainly groups of cases that present clinically entirely dissimilar characteristics during the period of cardiac incompetency which assuredly indicates some difference in the pathological mechanism at fault. For example, there are those who die of apparent cardiac exhaustion during the first few days of illness when the general picture has been one of malignancy. Again, and the most distressing of any, are those in which sudden death without warning sign occurs, sometimes when the little patient has appeared entirely well for many days.

Perhaps more common are those cases in which the development of progressive cardiac asthenia is of longer duration. Especially in convalescence, when vigilance has been relaxed, the heart action becomes weak, irregular, and in some cases there is extreme rapidity of the pulse which becomes small and difficult to count. With these foreboding signs there is usually restlessness, in older children great anxiety, cyanosis, and finally death.

In another class the symptoms seem less disquieting although none the less serious. The sufferers are apathetic, disinclined to be disturbed, lie quietly upon the bed, and avoid the slightest exertion which so frequently results in respiratory distress. It is in such that I have more often seen the slowing and weakening of the pulse rate, the beats falling below fifty or even forty-five per minute. The indifference and apathy of these subjects may be temporarily disturbed by the occurrence of vomiting which, according to many, is directly indicative of pneumogastric involvement.

Auscultation of the heart during the progress of the asthenia shows softening and muffling of the mitral sound, sometimes reduplication and "splitting" of the same, together with signs of cardiac dilatation. Gallop rhythm and endocardial murmurs are not infrequent.

In severe toxemias the kidneys rarely escape involvement. It is unfortunate that there is not a more widespread recognition of the fact that the kidneys in diphtheria may be almost as frequently the seat of disease as in scarlet fever. Albuminuria is constant in from one-third to one-half of cases and, according to some statistics of Northrup, there is actual nephritis in over 15 per cent.

Nephritis is a frequent cause of death among the fatal cases in the pavilion at Providence Hospital. The abruptness with which it may develop and the rapidity with which it may cause a fatal outcome may be illustrated by the following case:

Arthur S., admitted to the isolated building on December 14, 1909, with an attack of moderate severity. Within the third day after admission his temperature had reached normal where it ranged until December 23, ten days after entering the ward. On this day he had a sudden attack of vomiting with rise of temperature. His urine had previously shown but a transient albuminuria, but now contained albumin in large amounts and a profusion of casts and detritus while being much diminished in amount. Within three days death occurred from uremia. This suggestive case and others that have not terminated so unfortunately have led me to believe that the occurrence of nephritis is to be feared and to be guarded against by every precaution with which we view its occurrence in scarlet fever.

Northrup states (Nothnagel's system) that affection of the joints is extremely rare in true diphtheria. Bernardberg has collected ten cases, and, according to this writer, they occur

after the acute symptoms have passed or during convalescence. In several cases that have come under my own observation there have been joint pains usually transient in character, sometimes with swelling of the articulations, nor do I believe that arthropathies are as rare as some have stated. Two very severe cases of joint involvement have occurred in my cases this winter.

The first was in a colored child of about four years, who had a rather severe case of diphtheria but progressed satisfactorily until about ten days after admission when the left hip-joint became swollen and tender, a rise of temperature occurred, and the patient apparently was suffering acute distress. The swelling about the hip increased in severity, redness and induration supervened, and suppuration was suspected. I was so certain that a purulent effusion had involved the joint that I made an exploratory aspiration, but with negative result. Under the influence of very slight extension, aided by sand bags, the acute symptoms gradually subsided and the child is now well. There was no other joint involved.

The second case showed much more extensive joint disease. This was one of rather severe constitutional symptoms, but with very little membranous formation in the throat. The culture showed the Klebs-Loeffler bacillus, and 4,000 units of antitoxin were administered with resultant improvement in the general symptoms. About five days later there was considerable pain and redness about the seat of serum injection which persisted not longer than twenty-four hours. A few days later transient and mild pains occurred in the knee-joints and other articulations. These lasted for about one week, without constitutional symptoms and with no rise in the temperature. Then the elbow-joints became painful and reddened and in both effusion took place. The temperature rose to between 102 and 103°, there was very great pain in the affected joints, and the left-elbow assumed an exceedingly angry look. The swelling of this articulation was very great; there was redness and induration extending almost to the wrist and pitting of the skin over the whole area of the joint. Suppuration seemed imminent, but in view of the hip case I had observed so recently, I made no attempt to explore the diseased member. Bier's method of treatment with an elastic bandage was faithfully carried out by the nurse in attendance and within a short time the acute signs of inflammation subsided. The temperature and reactory symptoms diminished and ultimately the elbows recovered their

normal appearance, but the arthropathies in sequence next involved the wrists, ankles, vertebral articulations, the sternoclavicular, the chondrosternal and the sacroiliac joints. In none of the subsequent arthropathies were there constitutional symptoms nor fever, although there was much suffering on the part of the patient. The heart and kidneys remained normal throughout, and there were no evidences of pyemia.

I cannot see how such an extensive polyarthrits could be attributed to the effects of antitoxin, although I have mentioned the occurrence of redness and pain about the site of injection because "antitoxin disease," so-called, begins with a local reaction of that character, and is followed by arthritis in many instances.

Northrup attributes effusion without suppuration to the action of diphtheria toxins; suppurative arthritis to a septic process caused generally by the streptococcus. He further states that the suppurative cases produce more local and general symptoms and usually end fatally.

The limits of this discussion will not permit of a very extensive review of the nervous complications and sequelæ which form such an interesting group of cases.

A point of initial interest is that paralyzes of more or less severity may be brought to one's attention when the diphtheritic process which gave rise to them has been entirely overlooked. I recall three such cases, two of which occurred some years ago in members of the same family, in which the attending physician failed to recognize the relation between antecedent sore throats in these children and the occurrence in one case of derangement of the voice (palatal paralysis) and in the other paraplegia.

The third case but recently presented itself at the clinic at the Children's Hospital. This was a boy, aged eleven, who was brought to the hospital in a cab as he was unable to walk for any distance. He had the following history: A sore throat four weeks before, pronounced by the attending physician to be tonsillitis which caused him to remain in bed four days. He was then well for two weeks when his mother noticed difficulty in deglutition and later general weakness with staggering gait. When we examined this boy he presented a pitiable picture of multiple paralyzes. There was loss of the knee-jerks, partial paralysis of the leg muscles, ataxic gait, partial paralysis of the muscles of the back, so that the child sat in a stooped, huddled manner because of paralytic kyphosis, strabismus due to involvement of the sixth

pair, loss of the voice from laryngeal complication and a pathetic picture *in toto* as the legacy of a previous unrecognized diphtheria. We have not seen the boy since his one visit to the hospital so that I am unable to report the ultimate outcome of his illness.

The statistics of various observers do not coincide in regard to the frequency of paralyses, but they are probably met with in from 15 to 20 per cent. of all cases. The type most frequently seen is the palatal paralysis with resulting inability to close the nasopharyngeal space, nasal voice, dysphagia, and regurgitation of food through the nostrils. These simple cases usually clear up in the course of two or three weeks, but their occurrence should lead one to be on the lookout for more extensive paralysis the possible occurrence of which should be guarded against by strict rest of the patient and especial watchfulness as to further involvement of the nervous system. The local and general paralyses are equally the result of nerve degenerations from the toxins of the disease, and consequently may in many instances be prevented by the prompt administration of sufficient antitoxin.

In conclusion I would only draw attention to the growing practice among those who have had large numbers of diphtheritic cases to treat, of giving larger doses of antitoxin than have formerly been recommended. Osler's closing words in his article on diphtheria and Porter (*Arch. Ped.*, Aug., 1909) should be remembered when the question of dosage arises. Porter in every case of the laryngeal type gives an initial dose of 12,000 units and reports giving a child of nine months 38,000 units with the happiest results. He also makes the significant statement that an anaphylactic reaction is avoided by a large initial dose.

1730 M STREET, N. W.

THE TOLERANCE OF QUININE BY YOUNG CHILDREN WITH MALARIAL DISEASES.*

BY

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CASE I.—Early in November, 1909, I was called to see D. S., female, white, aged four and one-half years. On the morning of the first visit, her mother had reported that she had been

* Read before the Washington Obstetrical and Gynecological Society, February 18, 1910.

perfectly well until within a few days. Even now, no typical symptoms were evident, but she would be glad to have me call during the day, but not to consider it urgent, as her rectal temperature was only 99° . Upon reaching the house at noon, I found the family greatly alarmed because the child's temperature at 11.30 was 105.2° F. An examination showed an absence of any organic or eruptive disease, and her digestive tract had been cleared by castor oil. The sudden rise of temperature and the general appearance of the child forced me to the conclusion that the chilliness, followed by high fever, was due to malaria and I told the parents that the temperature would certainly drop by night. Nothing was done to reduce the fever, and at 6 P. M. the temperature was 101.2° . As there were now no other evidences of disease, I thought a diagnosis of intermittent fever was correct, so ordered 10 grains of quinine to be given before 10 A. M. the following day. The next morning the temperature was normal, but rose to 101 at noon. Ten grains of quinine were again ordered. On the third day the temperature remained normal, probably from 10 grains of quinine.

The temperature being normal on the fourth day, the quinine was reduced to 6 grains; but it reached 102° on the fifth day.

The urine and feces were examined with negative results. However, on the sixteenth day, she passed a lumbricoid worm 6 inches long. This proved to be a male, which accounts for the absence of ova in the stool previously examined. Santonin failed to bring any other worms. The nasal secretion was negative.

The blood, which was not examined until she had been taking quinine for a week, was normal except that the red cells were disintegrated—a presumptive sign that the malarial parasite was the most likely disturbing factor.

The child furnished the most astonishing case of the tolerance of quinine. In thirty-one days she took 365 grains of the muriate of quinine without at any time showing the slightest physiological effect. When she was taking from 10 to 25 grains daily, frequent tests of the hearing were made, but she could detect a whisper across the room. There was neither double vision, buzzing, trembling, nausea, nor urticaria. At one time I thought the quinine might be at fault, but that purchased at another store gave no better evidence. Thinking the drug might not be absorbed, the stools were examined frequently, but no free quinine was seen.

The liquid, capsule, konseal and cachet were tried, in turn, without noticeable systemic effect. When the quinine was stopped on the thirty-first day, she was given three times a day 5 grains of Warburg's tincture in powder (a total of $7\frac{1}{2}$ grains of quinine daily) for six weeks, without any inconvenience.

CASE II.—J. P., colored, male, aged seven years, was admitted to the Children's Hospital, D. C., October 7, 1909.

His family history was negative as to transmissible diseases;

and his personal history shows a clean bill of health, save an occasional "cold on the chest." A few days ago he fell against a trunk and injured the right eye. The eye swelled rapidly and in a couple of days both eyes showed much inflammation. He was assigned to the eye service, and was successfully treated by Dr. Griffith. The physical examination did not reveal any other disease.

His rectal temperature was 102° F. on admission and reached 105.6° F. at 4. A. M.

October 8.—It remained above 105 until 4 P. M., October 9, when it began to fall, and on October 10, 4 A. M., it was 98°. This reduction in temperature was not induced by antipyretics, antiperiodics, or by hydrotherapy. Quinine sulphate, gr. ii, t. i. d.

October 10, 11, 12, and 13.—The condition of the eyes improved and the temperature remained below 99°.

October 14, 4 P. M.—The temperature being 102.2°, the resident physician ordered quinine muriate, gr. iii, three times daily.

October 15, 1 A. M.—Temperature 104.6°, delirious and refuses to take quinine, grs. iii, t. i. d, dissolved in dilute hydrochloric acid. At 9 A. M. the temperature began to fall and at 4 A. M., October 16, was 97.8°.

After this paroxysm the case was transferred to my service.

A careful examination was made, but nothing was found to account for the sudden elevation of temperature. The urine showed nothing abnormal; there was no leucocytosis nor any abnormal condition of the blood.

Quinine muriate gr. xx ordered to be given daily.

October 19, 4 P. M., temperature 102°.

October 20, 4 P. M., temperature 102.8; 9 P. M., 98.4°.

October 26, 9 A. M., temperature 100.8°.

October 30, 4 P. M., temperature 102.8°.

November 4, 4 P. M., temperature 102°. (Blood examination negative.)

November 9, 4 P. M., temperature 103.4°.

November 10, Von Pirquet test negative,

November 15, 9 A. M., temperature 102.8°.

November 17, 4 P. M., temperature 101.8°.

Omit quinine and report rise of temperature.

November 18, malarial parasite (tertian) found.

November 19, 9 P. M., temperature 102.4°, 15 grains quinine daily ordered.

November 23, 4 P. M., temperature 104.2°, 25 grains of quinine daily.

December 10, decrease quinine to 15 grains daily.

December 12, 9 P. M., temperature 104.4°.

December 13, increase quinine to 25 grains daily.

December 17, 4 P. M., temperature 102.4°.

December 28, 9 A. M., temperature 101.8°. Malarial parasite negative. Red corpuscles pale and distended.

December 30, 4 P. M., temperature 101°.

January 11, 1910, temperature 100.8°.

January 25, discharged cured.

It will be seen that the boy took during his stay in the hospital 2,041 grains (4 ounces, 2 drams) of the muriate of quinine. Cinchonism was never detected, although the nurse reported on one occasion that he seemed to be a little inattentive. This, however, was not verified.

The clinical picture was so complete that I resorted to the large doses of quinine in spite of the repeated failures to find the organism. The blood was examined during the interval, at the height of the paroxysm and during the decline, with negative results; and yet it was found at the beginning of the paroxysm, after the child had taken quinine for six weeks. The drug was given in suspension, in solution, and in capsules.

These two patients may serve to illustrate many cases of malaria in children in which the tolerance to quinine in large doses continued over long periods has been most pronounced. I have had the good fortune during the past thirty-four years to have seen some unusual manifestations of the influence of the malarial parasite on the infant and young child. In such cases, it required very large doses of quinine to destroy the organism. In only a few could the parasite be detected, but the clinical picture was so perfect that quinine was given and the patients promptly recovered.

The following cases were seen in consultation and the main points are given from memory:

CASE A.—White, aged one year, was seen in consultation with two physicians. One Sunday morning the child ate his breakfast as usual and played about the room until 11 A. M., when he became fretful and sleepy. In less than an hour he was found to be in profound coma. A neighboring physician was called in and supposing the child had had a convulsion—the temperature being but little above normal—ordered intestinal irrigation and cathartics. Late in the afternoon the family physician found the infant conscious and ready for his supper. On Monday, the next day, he continued well and happy, and ate his meals with relish.

On Tuesday, he was well and hearty until 11 A. M., when he began to droop and by noon was again in coma. I was called in, heard the history, dispelled the idea of epilepsy and infantile convulsions, and expressed the belief in paroxysmal malarial coma. This opinion was reluctantly accepted by the physicians, whose astonishment was most marked when I advised them to give the baby 20 grains of quinine to swallow before 9 A. M. the following Thursday, and thereafter 8 grains daily, for one week. The physician reported to me that the child was cured. About eight months later a similar attack occurred, which I also saw. The same diagnosis was made, and the same treatment cured the case. In neither attack were there any evidences

of cinchonism. My friend had been accustomed to administer 4 or 5 chocolates of tannate of quinine daily to young children, so imagine his consternation at such dosage!

CASE B.—A few years ago I was called to a neighboring town to see a white boy, aged nine years, with coma (supposed to be uremic). He had been to church and on his way home said to his mother that he did not want any dinner. On reaching home, he went to bed and at 1 P. M. was found to be in complete coma. His surface temperature was normal. The family physician and a consultant treated him for uremia and later were surprised to find his urine normal and plentiful.

Monday he was well and remained at home.

Tuesday he ate his breakfast but seemed languid, and about noon he again became comatous. The urine being negative by heat test—a complete examination could not be made—10 grains of quinine daily were ordered when consciousness returned (6 P. M.).

Wednesday he was well and hearty and passed urine in normal quantity.

Thursday he was all right apparently during the early morning, began to be dull at 10 A. M., and was in the third coma at noon, when I was summoned. Here too the picture was so complete that I unhesitatingly expressed the opinion that the case was one of malarial intoxication, which was accepted only because a better one could not be offered. The quinine had been stopped because it had not prevented the third paroxysm. When 40 grains of quinine to be given before 9 A. M., Saturday, and 20 grains daily for a week thereafter, was advised, there was noticeable consternation in physician and parents, but they yielded to persuasion. The physician remarked that this was a malarious country and that people were accustomed to take quinine, but that he had never given such a large quantity to a child. I replied "I know that, and will stop the Saturday paroxysm without injuring the boy." About a week later the physician telephoned to me that the boy was well and that without cinchonism. I brought a specimen of urine up here, and it was found to be normal.

In the administration of quinine to children, especially infants, it must be remembered that they tolerate large quantities of quinine, and that there are rarely evidences of cinchonism in them. Quite often failure to destroy the plasmodium is due to the small doses of quinine, or to one of the many questionable preparations of the drug. If one is to get the full value of quinine, he should not rely upon palatable or tasteless preparations of it.

The problem in administering quinine to young children is not always easily solved. All attempts to disguise the bitterness, without interfering with the effectiveness of the drug, have signally failed. Efforts to fool the child by combining

quinine with some aromatic usually results most disastrously after the first dose. In most cases, the drug dissolved or suspended must be forced down the child's throat.

The salt to be used is a matter of individual choice, as one physician will prefer the muriate, another the sulphate, another the bisulphate, and still another the so-called tasteless preparations.

The administration by the mouth is by far the most satisfactory method, but at times a rebellious stomach thwarts all efforts in this direction. In the young, the liquid preparation must be depended on, while the older child may take a capsule, konseal, or cachet. Never give a child a pill of quinine, whether fresh, or gelatine, or sugar-coated. If a liquid menstruum is to be used, as yerba santa, syrup of chocolate, or coffee, the quinine should be added just before it is given. When the stomach will tolerate it, the quinine dissolved in either sulphuric acid (dilute), hydrochloric acid (dilute), or aromatic sulphuric acid will be very efficacious.

Quinine may also be given in suppository, but this method soon irritates the rectum and must be discontinued. It may also be introduced into the rectum in a small quantity of oil, milk, broth, or other bland vehicle; but this too may irritate the mucosa.

The drug should not be given to a child hypodermically, owing to the danger of injuring the tissues. I have not resorted to this method for more than twenty years.

Occasionally we meet with one who claims that he has gotten excellent results from inunctions of quinine. I have seen it tried in many cases, and have ordered it myself in a few, but I have never seen it cure any one of the malarial fevers. Therefore, I believe we should discourage its use.

Chocolates of the tannate of quinine are usually well taken, but their strength is only one-fourth that of the salts. If you want to give the equivalent of 10 grains of sulphate, just order forty chocolates to be given to the child, and see where you *will land!*

The tasteless preparations are readily taken, but they are of little or no value in true malarial paroxysms.

How much quinine should be given in twenty-four hours in a well-defined case of malaria, or even a suspected one?

My method is first to determine the hour of the expected paroxysm and then the quantity to be given. In a child three

to five years old, I would give 10 grains, in divided doses, before the hour of the anticipated rise of temperature the following day. If this dose prevented the paroxysm, I would decrease the dose to 6 grains daily for at least ten days. In the older child, I would give a proportionately larger dose and gradually reduce it.

To order such large doses of quinine may seem to be heroic, but experience has taught me that children suffering from malarial intoxication require proportionately more quinine than the adult with the same disease. Why not give large doses and secure quicker and better results?

FISSURE IN ANO IN CHILDREN.

BY

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ANAL fissure in children is a common malady and more often overlooked than one imagines. The chief symptom, pain, is often misinterpreted even by the physician. Infants under one or two years, who are fat and seemingly well nourished, and are constipated from whatever diet fault, or constitutional condition, are the most frequent sufferers from fissure in ano.

By fissure in ano we mean a small ulcer situated at the verge of the anus. The prefix anal should be used to distinguish this particular ulcer from one situated in the rectum itself, the rectal ulcer. The anal ulcer exists almost entirely within the sphere of influence of the external sphincter, and is a most distressing and painful affection, whereas the purely rectal ulcer, situated above the region of both sphincters, is often attended with little pain, and at times with none.

A typical anal fissure may be described as a small, more or less superficial ulcer, situated just within the verge of the anus, at the bottom of one of the rugæ, into which the anal orifice is thrown by the contraction of the external sphincter. The ulcer may be pear-shaped or triangular in form, extending upward into the longitudinal axis of the anal canal to a distance less than one-half inch. The apex is generally on the lower margin of the internal sphincter. The ulcer varies in depth in different instances; some extend only as far as the partially

torn mucous membrane, others to the submucous connective tissue. In yet another variety, especially of long standing, the pale fibers of the external sphincter muscle can be seen, and they form the floor of the fissure. Owing to the contracture of the external sphincter the lateral borders overlap the floor of the fissure, so that its full width cannot be seen unless they are first drawn apart. At the lower border of the fissure, or on one side of it, there is sometimes a small fold of skin, the sentinel pile of some authors.

The most characteristic feature of a fissure is its extreme sensitiveness, the merest touch causing intense suffering and invoking spasmodic contraction of the sphincters and levators ani. The exact location of this extreme sensitiveness varies with the depth of the ulcer, the skin and mucous membrane being most sensitive.

The position of the ulcer may be at any point in the circumference of the anal canal, but generally in the median line, or to the right or left of it, posteriorly.

The most important symptoms in children are pain, with sometimes associated dysuria and frequent urination, the latter often an associated symptom with the anterior fissure.

The mother may discover blood in the fecal mass and local examination by the physician reveals the fissure. Examination is best made, I believe, in the semiprone position. The sentinel pile may help in locating the fissure which would be directly above it. Otherwise the presence of blood in the fecal matter is almost a positive sign of a split or fissure in the mucous membrane around the anal orifice.

There is often an exposure of the nerve ends the same as in any freshly cut surface, which in some cases becomes a chronic inflammation.

Constipation is probably the commonest of all causes of fissure in ano. Besides this, anal fissure in children may be caused by congenital narrowing of the anal orifice, eczema, diarrhea, syphilis, and catarrhal diseases of the rectum.

Treatment.—Treatment of anal fissure may be either palliative or operative. Each case should be treated upon its own merits. In all cases palliative treatment should be tried for two or three weeks. At the end of that time, if marked improvement has not occurred, then an operation should be performed.

In cases of uncomplicated fissure, when ulceration is slight in extent and not deep; when not of long duration, and no

marked spasm or hypertrophy of the sphincters, then permanent cure is likely to follow palliative treatment. On the other hand, if the fissure is complicated by other rectal disease; if the ulcer is well marked and deep, especially when the muscular fibers of the external sphincter are visible; if the edges are thick and hard, and the sphincters are hypertrophied, operative measures are indicated.

It is well in these cases to thoroughly explain to the mother the proposed method of treating the case, emphasizing that palliative treatment cannot be considered certain, although worthy of a fair trial.

Palliative treatment consists of the application of local remedies, relief of constipation or catarrhal conditions, and local cleanliness. The local applications to be made in these cases depend largely upon the duration of the fissure. Many have been readily relieved by mild astringent applications such as hamamelis, while in others the solid stick of nitrate of silver or pure ichthyol have failed to procure the desired results. The longer the fissure has existed the more we have to stimulate, with due consideration for the patient, as the anal margin is probably the most sensitive part of the body. Balsam of Peru, nitrate of silver and pure ichthyol are, in my opinion, the best remedies in the chronic indurated ulcer. Pure ichthyol has given me more uniform satisfaction when applied every second day after an insufflation of orthoform to relieve pain. Along with this cleanliness, the normal control of the bowels and rest in bed if possible. Cauterization has not proved a success in my experience.

Operative treatment consists of dilatation and incision. Dilatation, or stretching by forcible or gradual means, has been in vogue for many years, especially among French surgeons, and has for its object the breaking up of the continuity of the muscular fibers or nerve strands, thereby relieving the muscular spasm. One has only to try to dilate the anus, to condemn the method, even under the use of cocaine, as the mode of application of any local anesthetic is terrifying to them.

The degree of incision of the external sphincter for the relief of a fissure has been discussed for many years, and seems not to have been settled yet. Each author advocates his or another method, so that it appears to make little difference as to which method is used if the surgeon limits his incision to the external sphincter only. The object and result must be the severance

of the muscular fibers which act upon the disease area. The incision can, therefore, be one which completely severs the muscle or that only penetrates it beyond these fibers, setting it at rest. The incision thus made should be through the ulcer and can be applied to a fissure at any point in the circumference of the anal canal.

The incision for the posterior fissure which appeals to me, and proved most successful, is the bilateral, which is made on each side directly transverse to the sphincter fibers, and a little deeper and longer than the ulcer. This double incision puts both sides of the muscle fibers at rest over which the ulcer is situated.

290 CLINTON AVENUE.

CHOLESTEATOMA WITH A REPORT OF A CASE WHERE THE DISEASE ITSELF HAD DONE ALMOST A COMPLETE RADICAL MASTOID OPERATION.

BY

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VIRCHOW considers cholesteatoma a true neoplasm consisting of pathological cells, arranged in lamellæ, and cholesterin crystals.

Lucas reports a case where there was no inflammation nor perforation of the skin or drumhead.

What are generally described as cholesteatomatous masses originate only in cases of perforation where the ear is diseased. According to some authors it would appear that these accumulations have their origin from the growth of the epidermis of the meatus into the tympanum. These epidermic cells are then thrown off. They form masses concentrically arranged and thus a mass of debris is formed in the middle ear composed of foul pus and cholesterin crystals in delicate capsules.

The mastoid antrum is often a favorite point of attack. These masses may take a long time to accumulate in the middle ear. They are usually of considerable size causing pressure on the bone and destroying it in the line of least resistance. Hence, operators have constantly tried to relieve this pressure by doing extensive radical operations and leaving the wound open.

Transplanting skin in the large open wound has been tried on the assumption that healthy epidermis does not tend to deposit cholesteatomatous material. The existence of a permanent large opening is thus maintained through which accumulations are destroyed, or removed at any moment if necessary.

The latest theory on cholesteatomata is that of Seebenmann, in which he claims that the cholesteatomatous matrix is not an invasion of pathological epithelial growth, but nature's way of repair. That the destruction of bone is caused by retention; this in turn gives rise to pressure in the cavities. He advocates radical operations solely for relieving this tension but without destruction of the matrix.

The advantages of this method are 1. healing in from three to four weeks; 2. less tendency to exuberant granulations; 3. less danger of diminished hearing. He claims that he has had no relapses in his clinical experience for some years back.

The following is the report of a case in the experience of the writer:

W. G., male, aged twelve years; had scarlet fever previously. The ear discharged continuously during six years. Pain in mastoid region at intervals. The family physician gave bichloride tablets to douche the ear at various times, also used saline solutions without any effect. Could hear watch on contact. Loud voice at distance of four feet. Unable to hear whispered voice close to the ear.

Left ear also affected. Had slight discharge at intervals. No pain. Could hear watch at twelve inches and whispered voice at three feet.

On examination of the right ear I found the entire canal filled with a white epithelial mass. By using a syringe this came away with some difficulty. Microscopically it consisted of a few crystals of cholesterol in addition to the lamellæ of large polygonal sharply defined epithelial cells.

The posterior wall of the bony canal had been necrosed and a mass of dark grayish material filled the lumen of the canal, so that it was impossible to see the middle ear. A portion of the mass was removed and found to be the same material as the mass taken from the canal of the ear. A probe could be passed through the posterior canal wall into the mastoid area. The passing of the probe caused considerable pain. Pressure on the mastoid region caused pain, and there was a slight swelling which was soft and yielded to pressure.

With a desire to make a general examination of the condition, I had him put under ether. Curetting in the middle ear carefully, and in the canal, did not seem to make any headway in removing the debris. It was endless and so useless to continue this treatment any further. I recommended a radical mastoid

operation and the father agreed to have it done at once. The patient entered the New York Eye and Ear Infirmary on the eighteenth of November, 1906. The radical operation was done the same day. When I made my incision I found that the radical operation had been already nearly finished. The disease had destroyed the entire bone. The lateral sinus was uncovered and found in good condition. The external semicircular canals came into view when the semi-gelatinous material was syringed out of the mastoid area. The periosteum only was in contact. The ossicles were all gone, as was also the whole posterior wall down to the mastoid antrum. The Eustachian tube opening was covered with granulations; the facial ridge was partly gone, but the nerve was not exposed. He had no facial disturbance either before or after operation. The small amount of bone left in the tip of the mastoid was removed with rongeurs, the ridge curetted down as low as possible without danger to the facial nerve. The tympanic end of the Eustachian tube was then curetted and the cholesteatomatous material removed as thoroughly as possible.

The regular flap operation was then done and the wound left open and dressed. The patient made a good recovery, epidurization being complete in seven weeks. I saw the patient two months ago, that is, three years after the operation, and he was then thoroughly well.

178 WEST EIGHTY-EIGHTH STREET, N. Y.

AMERICAN MEDICAL ASSOCIATION.

PROCEEDINGS OF THE SECTION ON DISEASES OF CHILDREN.

Meeting at St. Louis, Missouri, June 7, 8, and 9, 1910.

*The Chairman, WILLIAM J. BUTLER, M. D., of Chicago,
in the Chair.*

THE CHAIRMAN, in his address, considered the subject of enteroptosis in general, and gave a review of the literature. He stated that what is commonly termed enteroptosis was but one factor of a general habitus. The importance of a study of body form in the recognition of this habitus was emphasized, and he pointed out the great importance of recognizing the characteristic body form in children, and called attention to the period in which the ptoses of abdominal organs became evident.

THE DIAGNOSIS AND TREATMENT OF CHRONIC INTESTINAL INDIGESTION IN CHILDREN.

DR. SAMUEL M. HAMILL and DR. KENNETH D. BLACKFAN, of Philadelphia, read a joint paper on this subject. They drew attention to the frequency of occurrence of these intestinal con-

ditions, and pointed out their influence on the so-called mild conditions of ill-health, as well as their relationship to conditions of ill-health in later life. They emphasized the importance of studying the urine and stools in relation to the diagnosis, and outlined the treatment.

DISCUSSION.

DR. H. L. COIT, of Newark, New Jersey, had seen a great many cases that answered to the clinical picture given, and he thought it was the duty of every physician to remember that many cases of so-called epilepsy were not epilepsy at all, but were amenable to treatment. Most of the cases that he had seen of this class had been brought to him by physicians who thought they had epilepsy to deal with. He desired to speak particularly of the fact that physicians were too ready to use medicine in the treatment of dietetic intestinal indigestion in children without regard to the correction of the diet. In most of these cases the nervous symptoms were the cause of concern to the mother, and not the diet, and yet upon careful examination one would find a putrefactive condition. It might be a case where milk was used with red meats, or where milk was used at breakfast with fruit and sugar. In addition to that, we had overfeeding. In these cases there was restlessness, sleeplessness, indicanuria, there might be fits of uncontrollable anger, and there were foul-smelling stools. How could we clear up these foul-smelling stools. We could not do it with calomel, or castor oil, but he thought we could do it by the use of bichloride of mercury. Corrosive sublimate was abandoned by the surgeon because he said it was insoluble, and the same was true if given by the mouth; but it could be given in such a way that it would be effective. We could protect it by giving it with hydrochloric acid, and after a few days these stools would become normal.

DR. C. GILMORE KERLEY, of New York, emphasized the matter of rest in children, saying that all of the lower animals would lie down and sleep or take a rest after a full meal, and their digestive function was carried on better. When an animal had to work after a full meal, the assimilation was not so good. When there was wasted energy in a child there was invariably indigestion, malassimilation, malnutrition, and neurasthenia. He would keep these children in bed in the morning and let them have their breakfast in bed and give them a modified rest cure; then let them run about and play as a normal child until luncheon in the middle of the day; let them rest again for an hour and a half, and then let them run about, and then give them their supper, and let them go to bed. One of the greatest errors in the management of young children was in permitting the extraordinary amount of work they did from morning until evening.

DR. L. T. ROYSTER, of Norfolk, Virginia, asked whether Dr. Hamill had made any observation in the matter of temperature

during the convulsive seizures in the class of cases he mentioned, and whether he considered the temperature, either positive or negative, in any way suggestive of the diagnosis between that condition and epilepsy.

DR. H. M. McCLANAHAN, of Omaha, Nebraska, said the valuable thought in this paper was the possibility of intestinal indigestion and consequent toxemia leading to epilepsy. He had in mind a little girl who had repeated convulsions as often as once a week. She had chronic intestinal indigestion of the mucous type. After following out the course of treatment suggested by Dr. Kerley, the child absolutely recovered, and more than six months had elapsed since a convulsion.

DR. E. E. GRAHAM, of Philadelphia, stated that in considering the nervous symptoms, we should not lose sight of the fact that a convulsive seizure in a child was brought about from an entirely different cause from a convulsive seizure in the adult. In children the convulsion was commonly of reflex origin, while in the adult it was commonly the result of some organic disease of the nervous system. This only added force to the statement that chronic gastrointestinal disease might originate and produce epilepsy in the adult. The probability of convulsion due to an adult's brain injury was very remote, while it was very common in children.

DR. JOHN LOVETT MORSE, of Boston, emphasized the regulation of the diet in the treatment of these cases and said the only way it could be regulated exactly was to have the mother keep an accurate account of what the child ate, the exact quantity, and also to keep an accurate record of the child's stools. Only by this method could we determine exactly what the cause of the condition was. The only practical way of disinfecting the intestine was by changing the bacterial flora, and this could only be done by changing the food. He spoke of the value of the carbohydrates in changing the flora.

DR. FRITZ B. TALBOT, of Boston, said he had been impressed, in the stools that he had examined, by the fact that the meats and starches were very uncommon, and that the fats were very common in these cases of intestinal indigestion, and it seemed to him that the reason for this was that fat was the component of the food which the parents were more likely to give a child when it was run down.

DR. HAMILL, in closing the discussion, and referring to the remarks of Dr. Kerley regarding the value of rest, said he probably did not emphasize the importance of rest as he should. He had been inclined to believe that prolonged rest of the character mentioned by Dr. Kerley resulted in the accumulation of toxic products that were more depressing than those that accumulated in a briefer time. It was his practice to have these children get up at a comparatively early hour in the morning and let them rest later. He thought rest was very important, and he had even had these children separated from other children

and sent to the country and compelled to live a quiet life in the charge of a nurse. He thought that treatment would lead to the best results. He had had no experience with the temperature curve, but he did not believe there was any marked difference between the temperature curve in these cases and cases of epilepsy.

FURTHER REPORT OF CASES WITH COMPLICATING ILEOCOLITIS
AND PROBABLY DUE TO ACIDOSIS.

DR. THOMAS D. PARKE, of Birmingham, Alabama, stated that these cases were observed in children under three and most frequently under two; they began with ileocolitis, usually of mild type, and when typical symptoms supervened, the bowels ceased to act. The respirations became rapid and labored, pulse fast and weak. There was restlessness. There was vomiting in a proportion of cases. The liver took on enlargement rapidly. In fatal cases, which were twenty-one out of twenty-eight, death occurred in from forty-eight to seventy hours. Postmortem revealed only a mottled, fatty liver.

DISCUSSION.

DR. JOHN ZAHORSKY, of St. Louis, Missouri, stated that ever since the publication of Dr. Parke's paper, he had been interested especially in this syndrome, and he had found several cases. He had seen altogether only five cases that fitted his syndrome. The symptoms in these cases were those that had been pointed out by Dr. Parke, and these five cases were all fatal.

DR. ISAAC A. ABT, of Chicago, Illinois, had already put himself on record as having seen about a dozen of these cases. In nearly every one of them he had had an autopsy performed. The first case, the child of a physician, was taken suddenly ill, with vomiting, rapid respiration, rapid and low pulse, gradually went into a coma, and developed lastly a mechanical obstruction of the bowel due probably to atony. At autopsy, all of these had shown uniformly a fatty degeneration of all the organs. The acidosis was merely a symptom, and it was of no more importance than the rapid breathing, the rapid pulse, or the mechanical obstruction of the bowel, and he thought perhaps it would be wrong to ascribe too much importance to the acidosis.

DR. PARKE, in closing the discussion, said there was no coma in any of his cases, and there was no mechanical obstruction of the bowel. There had been dysentery and poor digestion; and, although the bowels did not act during the period of labored breathing, after the stage of labored breathing passed off, the bowels become loose again.

ATYPICAL SCARLET FEVER.

DR. C. GILMORE KERLEY, of New York, detailed some very interesting atypical cases of this disease.

DISCUSSION.

DR. O. T. MOORE, of St. Louis, Missouri, stated that in his work in the health department in St. Louis he was impressed with the absence of the eruption in some of the cases of scarlet fever he had seen, and in a few weeks desquamation occurred. In one case the child had no angina and no rash, yet in ten days ten children were taken out of that institution. The place was fumigated, and in ten days more seven new cases developed.

DR. S. E. MUNSON, of Springfield, Illinois, had had experience with one case of atypical scarlet fever. While studying in Germany, the son of the frau at the place where he resided came downstairs one morning with a sore throat. It had the typical appearance of a tonsillitis, and after a few days it became better. A few days later a fraulein in the household became sick, and he was asked to treat her. He never saw any rash in either of these cases, and anything more than a tonsillitis was not suspected. Some three weeks later he became very ill, and broke out with a typical scarlet fever rash and was in quarantine for three weeks. He had attended cases of scarlet fever and had been exposed to it when a child. This fraulein had no symptoms of scarlet fever other than a sore throat which was a typical tonsillitis.

INFECTIOUS DISEASES IN NEGRO CHILDREN.

DR. H. M. FOLKES, of Biloxi, Mississippi, said that any one having any degree of negro blood was included in the category of negroes. Any amount of white blood in the negro was of marked importance. Those having the largest proportions of pure negro blood were more susceptible to some diseases and less to others than were mulattoes, quadroons, and octoroons, and the reverse was also true. Negroes of all shades were extremely susceptible to tuberculosis, and also to measles. The larger proportion of black blood gave a larger degree of immunity to malaria, typhoid fever, intestinal diseases, scarlet fever, diphtheria, grip, tonsillitis, mumps, and pneumonia. Mulattoes, quadroons, and octoroons were much more susceptible to the preceding diseases. These three shades of negro were much more susceptible to the ravages of syphilis than were their more deeply tinted brethren. Negroes practically responded as well to treatment for infectious diseases as did whites.

DISCUSSION.

DR. L. T. ROYSTER, of Norfolk, Virginia, had a clinic in his home town, averaging about fifteen children a day, about ten or eleven of which were negroes. He was there during the months of January, February, March, and April, and he could not agree with Dr. Folkes that the negro possessed any immunity to pneumonia. He thought two-thirds of his cases were severe bron-

chitis or pneumonia. He had seen one case in a genuine black, who died, and a number of cases in negroes of mixed blood. Undoubtedly a mixture of white blood lowered the resistance of the negro to disease.

DR. FOLKES, in closing the discussion, said that pneumonia was very rare in his part of the country, either among white or black people, unless it followed or complicated the grip.

AGAR-AGAR IN THE TREATMENT OF CONSTIPATION IN CHILDHOOD.

DR. JOHN LOVETT MORSE, of Boston, said that agar-agar was derived from an alga of the *Gelidium* type and contained about 60 per cent. of carbohydrates. It was, however, very imperfectly utilized when ingested by man, and was very resistant to bacterial action. It absorbed water readily, gave it up with difficulty, and was passed practically unchanged through the intestinal tract. It kept the feces moist and increased their bulk. It was, therefore, indicated in that form of constipation which was due to over-absorption of fluid from the feces and in which the stools were hard and dry. Clinically it was very useful in the treatment of this type of constipation in childhood.

DISCUSSION.

DR. ALFRED FRIEDLANDER, of Cincinnati, said he had used regulin, a mixture of agar-agar and cascara, and it had given him very good results. He had mixed this with grapes or with stewed fruits. He had found that doses of about a teaspoonful to children, four or five years old, gave very satisfactory results, and that no bad habit ever formed, even if the dose had to be increased.

DR. C. GILMORE Kerley, of New York, had found it very difficult to give agar-agar. It answered all right for a time, and then lost its effect. He had given it in forty or fifty cases, and his results were not at all satisfactory.

DR. GODFREY PISEK, of New York, could corroborate what had been said about the difficulty of administration. With oatmeal it was taken better than in any other cereal, but the difficulty in getting the child to take it was a great disadvantage. There were a number of selected cases in which he believed agar-agar was beneficial, where there was a deficient amount of feces, and where they had had all manner of drug treatment.

DR. MORSE, in closing the discussion, wanted to repeat that agar-agar was not a drug. It was merely an agent for keeping the feces moist and increasing the amount. It did not have any irritant action upon the intestine.

THE SIGNIFICANCE OF TUBERCULIDES IN THE DIAGNOSIS OF TUBERCULOSIS IN INFANTS.

DRS. JEROME S. LEOPOLD, of New York, and I. ROSENSTERN, of Berlin, contributed a joint paper on this subject. They pointed

out the general significance of skin lesions in tuberculosis and described in great detail the various forms of tuberculides. They cited several cases, and presented conclusions as to the importance of these papulosquamous tuberculides as a diagnostic sign of tuberculosis in infancy.

DISCUSSION.

DR. F. C. NEFF, of Kansas City, Missouri, saw a few of these cases with Dr. Leopold in Berlin, and since then had tried to demonstrate some of these lesions on tuberculous children, but had not been successful. The cases were interesting from a diagnostic standpoint, and explained the positive Pirquet reaction we got in some children in whom an active tuberculous lesion was not demonstrable.

DR. FRANK GENGEBACH, of Denver, Colorado, saw a number of these lesions in Berlin and Vienna, but one must have them pointed out to him before he could appreciate their significance. Whether these lesions were limited to the Germans and Austrians he could not say, but he had found but few in this country, and in those cases in which they were present one could get the Pirquet reaction.

DR. WALTER D. HOSKINS, of Indianapolis, Indiana, asked how early this observation might be made in relation to fever or demonstrable signs in the glands or lungs.

DR. WILLIAM J. BUTLER, of Chicago, had seen cases presenting what was termed tuberculides about four years ago. He hardly thought it would be looked upon as of importance, as a rule, in so far as the early diagnosis of tuberculosis was concerned, as there were so many other points of importance in the diagnosis of tuberculosis that we could hardly lean upon it with any confidence; for we saw lesions similar to all appearances in children not affected with tuberculosis. He did not think any one looked upon the Pirquet reaction as a great aid in the diagnosis of tuberculosis in children beyond the second year. A positive Pirquet reaction did not mean an active tuberculosis unless it was within the first two years of life, and even at that time it would not be an absolutely positive differential aid.

DR. C. F. WAHRER, of Fort Madison, Iowa, asked whether they were early diagnostic signs of tuberculosis in infancy or were they later signs.

DR. C. GILMORE KERLEY, of New York, asked the essayists to describe a typical tuberculide.

DR. LEOPOLD, in closing the discussion, said, as to the frequency of these tuberculides, that Pollak, of Vienna, had reported about 100 cases seen in the clinic, and he found that the vast majority of those cases first showed symptoms in the bronchial glands or the lung, but in a number of cases he could find only these tuberculides. Concerning the frequency of these tuberculides in this country, he had been on the lookout for

them for six months, and had seen but one case. He thought these tuberculides were specific. The tuberculide began as a small papule; it was reddish in color; lasted from a few days to a week or so; sometimes there was a small vesicle in this papule that broke down and left a central depression. The redness then disappeared and a typical tuberculide appeared. This consisted of a barely perceptible papule with a central depression. It was of a brownish color, and glistened when the skin was stretched. They usually appeared on the lower extremity. Usually the number was very small. Often only one would appear. The largest number he had seen was twelve. There was very slight induration. The duration varied from several days to a few weeks.

PSEUDOLEUKEMIC ANEMIA IN INFANCY.

DR. THEODORE J. ELTERICH, of Pittsburg, Pa., read a paper on this subject in which he briefly reviewed the literature, reported a case, described the course of the disease, the blood examinations, and the autopsy findings.

THE SURGICAL TREATMENT OF CONGENITAL PYLORIC STENOSIS.

DR. ARTHUR DEAN BEVAN, of Chicago, Illinois, gave a brief review of the subject, and discussed the pathology, both gross and histological. He described the symptoms and mentioned the points in diagnosis. No medical treatment was of value or should be considered. He compared the relative value of pyloroplasty and gastroenterostomy, and concluded that a posterior gastroenterostomy was the operation of choice. The question of jejunostomy in patients operated on in extremely bad condition was discussed, with the conclusion that this might be in exceptional cases indicated.

DISCUSSION.

DR. H. M. McCLANAHAN, of Omaha, Nebraska, was glad to hear Dr. Bevan advocate surgical procedure, for in his experience surgeons had been very wary about operating on these patients. Several years ago he had a patient on whom he advised operation, and the surgeon refused. He had the specimen and the pylorus was occluded by the muscular hypertrophy. The mucosa was not at all thickened. There was a pyloric stenosis and there was also a pyloric spasm, and that in his judgment would give the frequent vomiting and characteristic symptoms. Some of these little patients continued to live even with a considerable degree of stenosis. He had such a child under observation, and while it was in fairly good condition, it had an enormously dilated stomach. What result would this have on the child's future life? He heartily agreed with the position taken by Dr. Bevan that the baby had just as good a right to surgical relief as man.

DR. JOHN LOVETT MORSE, of Boston, said his own feeling was that when there were typical symptoms of vomiting, constipation, and visible peristalsis, immediate operation should be advised. If tumor was present, there was no question about operation. The earlier the operation was done the better the prognosis. It was up to the medical men to see that the operation was done early. Every surgeon he had ever seen operate on these cases had lost his first case, usually his first two or three cases. It required a very careful technic, and if the operation was not done exactly right, and the loop was not made in exactly the right place, the baby would die.

DR. ISAAC A. ABT, of Chicago, stated that during the past year a number of cases had come under his observation which by means of stomach washing, antispasmodics, heat to the abdomen, and breast milk, were doing very well. He thought, of course, there was a distinct surgical indication. There were cases where the diagnosis between spasm and obstruction was difficult, if not impossible; and in those cases he thought we could well afford to wait and give the baby the benefit of medical treatment. In every community there were only a few surgeons who could do this operation successfully, and the promulgation of the theory that operation was the only treatment was extreme. Where the baby was holding its own, where it was not losing weight, it had been his practice to wait and treat the baby medicinally.

DR. E. J. PORTEOUS, of Atlantic City, was particularly interested in the paper, inasmuch as he had in Atlantic City a case of suspected pyloric stenosis, although it turned out to be spasm and congenital appendix irritation. The child had done beautifully since, and the question of stenosis was cleared up at the time.

DR. C. GILMORE KERLEY, of New York, had had two cases in the last year that apparently had recovered. He did not know what the future of these patients would be, but it might be that they would not be in as good condition at three or five years of age, but they were now entirely relieved of every symptom relating to pyloric stenosis. They were put on breast milk, the stomach was washed out, and they were given some simple sedative. One was given paregoric and one bromide by the rectum, and they recovered. They were still under observation, and were suffering no inconvenience. He did not think it was a good scheme to let the pendulum swing too far in the way of operation or the other. Of course, obviously, operation had to be done in some of these cases, but not all cases of pyloric stenosis were of that character.

DR. HEINRICH STERN, of New York, saw one such patient who was now twenty years of age. The physician who saw her shortly after birth made a diagnosis of congenital stenosis. She now had a very greatly dilated stomach, containing about four liters; she had never weighed over seventy-five pounds and she was a burden to herself and to her family.

DR. KATHARINE RICHARDSON, of Kansas City, Missouri, stated that at the Mercy Hospital in Kansas City they had on an average forty children. In times past a diagnosis of pyloric stenosis had been made in many cases, and in every case but one the children had recovered without operation. In many of the cases they had had the opportunity of examining the children later, and she had recollection of but one case where they had not entirely recovered. She had no doubt that there were exceptional cases in which operation was required, but she thought the staff would very likely wait and try medical treatment first.

DR. FRITZ B. TALBOT, of Boston, thought the question frequently came up whether the operation was going to change the digestive functions, and with this in view Dr. Joclyn performed two metabolism experiments on adults, one a case of cancer, and one ulcer of the stomach. In both the digestion of fat was faulty. Dr. Scudder collected for him eight cases so that he could examine the stools, and of this number in only two was there any trouble with the fat digestion, and in but one was there any trouble with the proteid digestion. There was no indigestion of starch. He made metabolism experiments on two babies after operation, and in neither was there any digestive disturbance of fat or proteid. One absorbed and digested 98 per cent. of the proteids, and the other 96 per cent. of fat and proteids.

DR. FRANK S. CHURCHILL, of Chicago, Illinois, said that if these babies vomit persistently we should examine the abdomen and see if there was a peristaltic wave. Then, if, in addition to this wave, there was a great deal of pain, we should suspect the possibility of genuine pyloric stenosis. This did not necessarily mean operation within the first few days, but if these patients were constantly losing weight and did not improve we should operate, even if we could not feel the tumor in the baby's abdomen. He presumed one of the cases reported by Dr. Bevan was a patient upon whom he (Bevan) operated for him. In that case he could not feel a tumor, but Bevan could. The kind of operation should be left to the surgeon.

DR. FRANK GENGEBACH, of Denver, Colorado, said that one would get the idea from the paper of the essayist that pyloric spasm and pyloric stenosis were complete entities. Heubner believed that these cases were at first pyloric spasm, and owing to the excessive resistance to irritation the hypertrophy began, and this hypertrophy might go on to a marked degree or even to complete stenosis. For that reason, medical treatment was recommended by him first, he recommending a low, flat diet, etc., and, if the child continued to have stools and to hold its weight, he advised against operation, for the reason that the mortality therefrom had been very great.

DR. H. L. COIT, of Newark, New Jersey, said that these so-called cases were veritable cases of pyloric stenosis that occurred,

not at birth, but after the third or fourth week, and while they were taking breast milk. If we could find the irritant used in the first weeks by breast-fed babies, it might help to arrive at the cause. The usual use of a saturated solution of boric acid in the mouths of these babies and on utensils used by these babies should be considered. He had for twenty years opposed the use of a saturated solution of boric acid in the mouths of babies, and in many cases he had cleared up this condition by eliminating the use of boric acid. He had a child sent all the way from Tennessee to him, and the only thing that was necessary to eliminate the vomiting was to stop the use of boric acid.

DR. WILLIAM J. BUTLER, of Chicago, said the treatment depended on accurate differential diagnosis as to whether spasm or organic obstruction existed. This was impossible on first examination of the patient. A palpable tumor had been spoken of as occurring in organic stenosis. This might occur in connection with spasm of the pylorus as well as with thickening of the pylorus. In spasm of the pylorus in the adult, sometimes one could palpate this tumor and feel it relax under the finger. In other words, when it was closing down, one could feel distinctly the pylorus at that time. The same was true in a child. If it was an organic stenosis or a spasm of the pylorus, one might feel the thickened or contracted pylorus, not a mass as big as the thumb, but a small mass about the size of a cranberry. The regurgitation of bile into the stomach was not likely in stenosis or pylorospasm. Was there any way of deciding whether one was dealing with spasm or organic obstruction? The only way he could conceive of determining this clinically was by treating them medically at first. If after gastric lavage, limiting the quantity of milk given by having the breast pumped, and the quantity of food the child received carefully regulated, and having the feeding at intervals of three or four hours, we found under these conditions the children improved and the vomiting subsided; and they began to have stools and to gain weight, there was every reason for continuing this treatment and for believing we were dealing with a spasm of the pylorus. If, after several days or longer of this treatment, the child was very little affected and no permanent improvement was noticeable, there was every reason to believe that we were dealing with organic stricture, and in these cases it was not advisable to temporize. Medical treatment would not cure an organic stricture, and, provided the child could stand it, surgical intervention was indicated.

DR. BEVAN, in closing the discussion, said he agreed with what Dr. Butler and Dr. Abt had said. The patients that might need medical care should be handled in that way, but those were certainly not cases that might be diagnosed and labeled stenosis; for if one of those children improved and went on improving, it was not stenosis. There might be a larger amount of muscular fiber than was common in a child with some spasm, but we were not warranted in calling that stenosis. The operation was

reserved for those cases in which the child continued to lose weight and where the vomiting persisted.

THE NEBRASKA EPIDEMIC OF POLIOMYELITIS.

DR. H. M. McCLANAHAN, of Omaha, Nebraska, gave a history of the Nebraska epidemic, including the reports from the attending physicians. He outlined the geographical distribution and mode of spread of the disease, described the types of cases, and the bacteriological findings, and mentioned the mortality.

DISCUSSION.

DR. C. A. Anderson, of Stromsburg, Nebraska, said he came from a county in which more cases of the disease had occurred than in any other county in the state. He had had sixty-eight cases in his practice. The first case he saw occurred May 20. A number of other cases had occurred throughout the state, but had not been reported. From May 20 to July 4 there occurred in the vicinity of Stromsburg thirty cases. On June 30 he found the first three cases he had seen paralyzed, but he found other doctors had paralyzed cases. During the thirty days following the celebration of the Fourth of July about 150 cases occurred in Stromsburg and vicinity. On July 21 they were recommended by the State Board of Health to quarantine these cases, and inside of thirty days the epidemic was controlled in Stromsburg. The epidemic reached the county east of them later, and they profited by their experience and promptly quarantined the nine cases that occurred there with the result that not a single additional case occurred there. This prompt result from the quarantine occurred in other places.

DR. E. H. BARTLEY, of New York, stated that one important point in the history of this epidemic was in regard to the period of incubation. The essayist had said about two weeks, and Dr. Anderson's figures made it about two weeks after the quarantine, when the epidemic stopped suddenly. If they could tell how long after the fourth of July celebration the large crop of cases appeared, it would assist in determining the period of incubation.

DR. McCLANAHAN, in closing the discussion, said his cases were limited to forty-seven, and of the seven bulbar cases all died. Twenty-two cases came to him because of the paralysis, all of the ordinary type, one with complete paralysis of the left side of the face. He did not find in any of the eight cases in which lumbar puncture was done the diplococcus intracellularis. In three the fluid was absolutely sterile.

DR. C. GILMORE KERLEY, of New York, said that inasmuch as the quarantine was very effective, he would like to know how it was carried out.

DR. C. A. ANDERSON, of Stromsburg, Nebraska, said it was not an absolute quarantine. It was the same that they carried

out for diphtheria. The members of the family were required to stay at home, and the bread-winner was allowed to go about after taking certain precautions. This was very effective in his community, for the public was thoroughly aroused to the danger of the disease.

DR. ISAAC A. ABT, of Chicago, asked how many of the patients were adults.

DR. ANDERSON replied that, of the eighty-six cases, about 80 per cent. were under ten years of age. The oldest patient was eighty-six years of age, and died of bulbar paralysis. There were a number from thirteen to thirty-six years old.

RACHITIS.

DR. J. W. VANDERSLICE, of Chicago, Illinois, said that rachitis was a dystrophy. The one constant factor in etiology was an indigestion. The symptoms caused by the rachitis must be differentiated from the results of an earlier rachitis. The diagnosis should be limited to the symptom-complex of restlessness, tenderness, digestive stress, with changes in the bones and musculature.

BLOOD-LETTING IN CHILDREN.

DR. HEINRICH STERN, of New York, pointed out that blood-letting, even in times when it flourished, was rarely employed in children. He quoted cases from modern medical literature, and said blood-letting was indicated in acute conditions, especially uremia.

DISCUSSION.

DR. E. MATHER SILL, of New York, said blood-letting would be very good in diminishing the blood pressure in cases of edema due to congestion. He had been accustomed to use aconite and sweating in these cases rather than blood-letting. He had found that in cases of congestion due to bronchopneumonia the old-fashioned method of blood-letting would give relief, but blood-letting would be contraindicated in pneumonia where the children were run down.

DR. ABRAHAM JACOBI, of New York, said he could only repeat what he said forty years ago, and forty years ago he spoke from an experience of seventeen years' practice in New York. He had not modified his opinion as expressed at that time. We could not say beforehand uniformly how much blood should be taken. The cases were not alike, and it was impossible to say that. The baby had about 19 per cent. of its weight in blood, while the adult had about 17 per cent. If a child weighed forty pounds, about two pounds would be the amount of blood in that child, and in that proportion the blood should be taken. No large percentage of the amount circulating in the body should be taken away.

DR. WILLIAM J. BUTLER, of Chicago, did not think the essayist had given sufficient proof of his statement that blood-letting in childhood was one of the most potent remedial agents. As to blood-letting in uremia, while all would agree that in these cases where the child was in a state of uremic coma blood-letting would be advisable on the basis apparently of lessening the tension, due to intoxication, etc., he had not indicated how much lessening of the tension actually occurred. As to cerebral tension, he did not see how blood-letting would have any advantage over spinal puncture.

DR. STERN, in closing the discussion, said as to the effect of the abstraction of blood, there were two different ways by which the mechanical effect of lowering the blood pressure was produced. In uremia we had a relief of the vasocontraction. This vasocontraction did not occur in the brain, but it was localized in the kidney, and that could be relieved by blood-letting. In other instances, for example pneumonia, it was only the engorged right heart which was very much dilated at times which, by the abstraction of blood, became very much relieved and the attacks of dyspnea suddenly ceased, and great improvement in the general condition was noticed.

FEEDING OF FATS TO INFANTS AND THE DIFFICULTIES ENCOUNTERED IN FEEDING THEM.

DR. CHARLES DOUGLAS, of Detroit, Michigan, spoke of the age when fat was most perfectly digested, and mentioned the amount of fat which is properly digested by infants. He spoke of the results produced on the digestive secretions by overfeeding.

He mentioned the foods which must be avoided on account of the fat they contain.

THE DIGESTION OF FAT IN INFANCY.

DR. F. B. TALBOT, of Boston, discussed fat in breast milk, in cows' milk, and in breast nursing. He spoke of the physiology of digestion of fat, and of the influence of other foods on the digestion of fat. Fat should be given up to the physiological capacity of the individual baby. When fat was given in excess of the physiological capacity of the individual baby, the digestion of fat was abnormal.

COMPLEMENTAL FEEDING OF THE INFANT AS AN EFFECTIVE AID IN MAINTAINING MATERNAL NURSING.

DR. THOMAS S. SOUTHWORTH, of New York, stated that measures to reduce infant mortality were of paramount importance to-day. Breast milk was more likely to insure the infant's life and growth without intercurrent digestive disturbances. He spoke of the advisability of supplementing a more or less

deficient breast milk, pending its further establishment, so as not to lose the advantage of the natural impetus to growth possessed by newly-born infants. He described the effect of the infant's increased weight and vigor on the maternal secretion, and spoke of the advantages of small complemental feedings given after each nursing. The requisites for such feedings, the materials employed, and quantities, were given. He exhibited a series of weight charts showing the results in typical cases.

DISCUSSION.

These four papers were discussed jointly.

DR. JOHN ZAHORSKY, of St. Louis, Missouri, had been taught to give the newly-born baby low proteid and comparatively high fat, and it was true that this was frequently a success; that is, when the fat was not over 2 per cent. Recently he had been trying to get the ratio of fat and proteid much closer together. The difficulty encountered was that casein would lead to soap stools on account of the fact that it diminished the digestion of. Should we try to give the young baby a low protein and comparatively high fat, or a high percentage of protein and a comparatively low fat? This was the problem he wished to present. The European authorities held that there was no such thing as a casein stool. He was convinced that the Boston argument was correct, that there was a stool in which there was casein as a central nucleus. For several years he had insisted upon having the mother nurse the baby every time, and if the mother's milk was deficient to give a little supplemental food after nursing. This was a much better method to conserve the normal maternal nursing than supplemental feeding. If we were to retain the activity of the breast that was deficient in activity, we must keep up the stimulus to the breast, and he was delighted that Dr. Southworth had brought this out in his very practical paper.

DR. EFFA V. DAVIS, of Chicago, agreed with Dr. Zahorsky. In the last few years she had discovered that it was in the afternoon and evening that the mother gave the least milk. Frequently in the morning she would give a sufficient quantity. In such cases she compromised with the patient and asked her to give complemental feeding in the afternoon. This could be determined, if there was any doubt about it, by weighing the baby before and after nursing.

DR. J. P. SEDGWICK, of Minneapolis, Minnesota, said with reference to Dr. Southworth's paper on complemental feeding, he thought those of us who had tried it had found it of great value. He thought we could well use even more accurate methods; namely, weigh the children before and after nursing, and then supplement the breast milk with enough food to come somewhere near the caloric requirement. He thought this was a valuable check, although we could not feed a child exactly according to its caloric requirement.

DR. JOHN LOVETT MORSE, of Boston, said that reference had been made about giving these babies too much fat. What was too much fat? It seemed to him, it was more fat than that individual baby could digest, and not any particular percentage of fat. We could not say that 2, 3, or 4 per cent. of fat was the limit.

In considering the disturbance of the digestion of fat in babies we must take cognizance of whether we were dealing with a well baby or with a sick baby, as the conditions were entirely different. Much had been said about the dangers of fat. In the last article he saw in a German medical journal it was claimed that the primary cause or disturbance was the carbohydrates, and that the disturbance of digestion of fat was secondary. He wanted to come to the rescue of supplemental feeding. There was no doubt that all Dr. Zahorsky had said was true, but there was another side to the question. He had found that the modern woman with all her social and family arrangements had to have more than two or two and a half hours at one time away from home, and he had found that she did better and could nurse her baby longer with a supplemental feeding than if she tried to nurse it every time.

DR. C. F. WAHRER, of Fort Madison, Iowa, said that, while he agreed with Dr. Zahorsky, he wanted to sound a note of warning. It was so much easier to put some food in a bottle and turn it over to some member of the family to feed the baby while the woman was thus allowed to go about her various duties. In case a woman lost her child, or something of that kind happened, we were taught that by giving the woman twenty grains of citrate of potash, this would aid in drying up the milk. Careful observers at Johns Hopkins have said we should do nothing, but let it dry up. Careful experiments have shown that if let alone, it dries up sooner. There was danger in supplemental feeding. The mother should be taught to give the child all she can give, and then, if necessary, give it complemental feeding. In rural districts many people brought up their babies on cows' milk and added half as much again of cream, and they did well. It was wonderful upon what things some children would thrive and grow fat.

DR. J. M. BRADY, of St. Louis, Missouri, stated that the clinical results from some observations he had made along this line would seem to show that babies fed low fat, particularly during the first two months, did much better than when fed on higher fat. The use of top milk in making dilutions had not been as successful in his hands as a 1/2 per cent. of fat.

DR. C. GILMORE KERLEY, of New York, said that in every discussion of this sort the idea was always brought up of the indifference of the young mother of good standing with regard to the function of nursing. He disagreed absolutely with Dr. Zahorsky, and stated that if one wanted to make one of these well-to-do young mothers discontinue her nursing function, it

should be made onerous for her. She was accustomed to go horseback riding and to go to afternoon teas, and if she was pinned right down and kept on the job all the time she would grow stale on the work. Anybody would get tired of a job if he was kept at it too long. One could not take a high-class young mother and make an animal out of her just because she had a baby, but if one would let her have some of the life to which she had been accustomed, it was one of the best methods in the world to enable her to continue this function. That giving this supplemental feeding once a day would discontinue the nursing function had nothing to do with it.

DR. A. C. COTTON, of Chicago, thought a little more emphasis should have been laid upon the utilization of mothers' milk, even if it be in extreme reduction. There should always be an effort made to stimulate the lacteal secretion. Even though there be but two or three grams of it, it was worth saving. There was something in mothers' milk which acted as an exciter to the digestive functions that we could not imitate in any artificial food. Even only a gram or two of mothers' milk might be sufficient to promote digestion.

As to the digestion of fats, he presumed we would never come to an agreement. Dr. Morse had hit the nail exactly on the head when he said enough was enough, and too much was too much. No exact rule could be laid down for the individual baby. The differences between the fat of cows' milk and the fat of maternal milk were sufficient to prevent any comparison as to quantity ever being attempted.

DR. CHARLES DOUGLAS, of Detroit, said he used complemental or supplemental feeding according to the needs of the woman. He might use the supplemental method until the woman recovered her strength and was able to do the whole work herself. The point of stimulating the breast once in so often was good, but that stimulation might be once in two hours, once in four hours, or once in six hours, and if the woman was worn out or exhausted, he thought she did better with four or six hours' rest. In the case of a woman who was strong, he thought two hours was better.

DR. F. B. TALBOT, of Boston, stated that Dr. Sedgwick was his authority for the statement that 25 per cent. of the fats were split up by the secretions from the stomach.

The physiological power of the normal baby to digest fat was higher than the physiological power of the sick baby, and, therefore, the normal baby could digest much larger amounts of fat than a sick baby, and he thought that in many places this fact was not made use of or appreciated.

DR. SOUTHWORTH, in closing the discussion, said he used supplemental feeding for other cases, but he should limit the complemental feedings to the first few weeks of life when he was trying to get the child started on the upward road to growth and nutrition. He made a large use of supplementary feedings later.

THE INFLUENCE OF COLLOIDAL PROTECTION ON MILK.

[**DRS. JEROME ALEXANDER** and **JESSE G. M. BULLOWA**, of New York, read a joint paper on this subject. With the ultramicroscope it had been demonstrated that with increasing fineness of subdivision the motion of the subdivided particles continued to increase in speed and amplitude until it became so vigorous and extensive that the particles no longer settled, but remained permanently afloat; that is, we had a colloidal solution. This condition was consequent on an extremely fine state of subdivision, and practically any substance could be converted into or produced in this condition. Some colloids were quite insensitive to electrolytes and readily redissolved after desiccation (stable or reversible colloids); others were readily coagulated by electrolytes and did not redissolve on desiccation. These were unstable or irreversible colloids. The reversible colloids protected the irreversible colloids from coagulation. If the amount of protective colloid in cows' milk was increased, it was less easily coagulated, thus resembling mothers' milk.

DISCUSSION.

DR. FRANK S. CHURCHILL, of Chicago, said that in feeding a fairly healthy baby it was not necessary to split the proteids, but in the case of babies of limited casein or proteid digestive power, we had to use split proteids, doing it by substituting whey, or some suitable mixture.

DR. E. H. BARTLEY, of BROOKLYN, asked whether the milk sugar passed into a colloidal or crystalloidal state. It was known that milk sugar, when first dissolved, would give a certain rotation in the polariscope for twenty-four hours, and then it ceased.

DR. THOMAS SOUTHWORTH, of New York, said the paper was interesting on account of its bearing on certain things which we had been doing for a long time without an explanation. All the information we could get of a collateral order, which proved or disproved the theories on which we had been working, was of the greatest value to the pediatrician. He hoped the authors would correct the impression that he thought they did not mean to convey, namely, that it was possible by the protection of colloids to prevent the coagulation of casein. We knew as clinicians that, whereas it interfered with it, we might still get large curds in stools where such things had been added to the food.

DR. ALEXANDER, in closing the discussion, said he was chary of the term split proteids and of its significance, but in a paper of this kind he could not go into all the points on the subject. There was a great difference in the protective action of the various colloids. Not only did each individual substance vary, but it varied according to the individual medium in which it

was. Gelatine was the most active of all the colloids, but as all varied considerably in their protective action, one must find out from his experience which of the protective colloids was the most efficient in the particular case. As to whether milk sugar went into colloidal or crystalloidal solution, there was not much difference. It was possible that the particles underwent a progressive decrease in size, and there was no way of saying where the colloidal solution ended and the crystalloidal solution began. Colloidal protection would not necessarily prevent the curding of casein entirely, but that would depend upon the acidity of the gastric juice, and that would be influenced by the sugar contents or whatever would make for lactic acid. When we increased the protection of casein in cows' milk we simply tended to make it more difficult to coagulate that casein. Whether the casein would coagulate in the stomach or not, we had no means of saying, but as far as the test-tube showed it was much more sensitive to acid.

To be Concluded.

REVIEW.

THE DISEASES OF INFANCY AND CHILDHOOD. Designed for the Use of Students and Practitioners of Medicine. By HENRY KOPLIK, M.D., Attending Physician to the Mt. Sinai Hospital, New York; ex-President of the American Pediatric Society. New (3d) edition, enlarged and thoroughly revised. Octavo, 944 pages, with 204 engravings and 39 plates in colors and monochrome. Cloth, \$5.00, *net*. Lea & Febiger, publishers, Philadelphia and New York, 1910.

It is rare nowadays that the third edition of any work calls for extended comment. This is the case, however, in the present instance, for we are not asked to rest content with the same pages and a few emendations.

In examining the text it is interesting to find that Dr. Koplik takes the conservative position that the majority of infants after six months of age do best when top-milk is employed, by securing all that is required for the day's feedings from the top of but one quart bottle of milk, thus keeping the fat reasonably low and avoiding overfat feeding. Under "Methods of Examination" we would suggest that cerebral lesions and those of the cord might be more clearly differentiated for the reader in the discussion of resulting paralyses on page 57. The figures from Lachs, Vierordt, and Alix, giving the normal rectal temperature from birth to four years of age as 99.5°-100.2° F., are an interesting contribution to this somewhat disputed subject.

The utility of this work has been vastly enhanced since the

appearance of the first edition by largely increasing the space given to the important topic of infant feeding. In its final form this section is now of a high order.

Few American writers upon pediatrics show so clearly the evidences of the influence of the German school as does Dr. Koplik. To a certain point this adds to the value of his text by giving the American reader a broader outlook. While the earlier editions were based largely upon his own work and that of continental authorities, there is now a praiseworthy tendency to give fuller recognition to the views and studies of American pediatricians.

In contradistinction to some recently published volumes which aim chiefly to give the student a succinct outline of the various affections of childhood, Dr. Koplik's work with this edition enters assuredly into the first rank of treatises upon the subject for the use of the thoughtful practitioner. T. S. S.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Hypothyroidism and Dysthyroidism in Children.—Luigi Concetti (*Riv. di Clin. Ped.*, Feb., 1910) says that the children of mothers who give evidence of hypothyroidism also show symptoms that may be laid to a similar condition. The stigmata of insufficiency of the thyroid are obesity, sleepiness, transitory edemas, thin hair, vasomotor disturbances, unstable nervous system, vomiting, and failure of resistance to tox-infections. This condition is observed in artificially fed as well as breast-fed children. Histories have been published of children in whom there was a marked retardation of development, with cutaneous dystrophies and rachitic manifestations, the mother being affected with goiter. These infants are restless, sleep badly, became thin, nurse ravenously, vomit, and have vasomotor symptoms. This condition is children benefited by the administration of thyroid extracts. In some children asthmatic attacks, headache, and eczema seem to have this origin, and they are benefited by thyroid treatment. The relations between the thyroid and the ovarian functions is well known. In pregnancy with hypothyroidism labor is followed by inertia uteri. Pregnancy is sometimes prolonged far beyond normal limits on account of this same inertia.

Influence of Feeding on Development of Stature.—V. Wallich (*Ann. de gyn. et d'obst.*, March, 1910) finds statements in literature that the feeding of children during the first year and a half has a marked effect on the growth in stature, and that the first year determines the height in later life. If development in this respect is not perfect during the first year of life the failure of

growth can never be remedied. The author has made measurements of adults in connection with the histories of their development and feeding during the first year, which go far to show that these statements are based on a firm foundation. His measurements were made in 167 women at the Baudelocque Hospital, in the service of Pinard. The practical considerations resulting from these measurements is that we should watch over the feeding during the first year, with especial care, if we wish to have children of normal height. If growth amounts to five centimeters in the first month and ten centimeters in the first three months conditions are normal. It is on this period of three months that we must concentrate our attention, and obtain breast-feeding. Faults of alimentation at this period cannot be repaired. Fifty per cent. of infants artificially fed die during the first year, and of the survivors one-half are badly developed and one-third have gastrointestinal troubles.

Cutaneous Tuberculin Test.—C. F. Von Pirquet (*Arch Ped.*, March, 1910) says of the test which bears his name that a positive reaction means a previous infection with tuberculosis. We do not know by the reaction alone how far this infection has gone; it may be that the infection is limited to one single gland, or that one-half of the lungs has already been destroyed by the tuberculous process. In general the reaction is very intense if the infection has just started or if there has lately been a progress. The negative reaction is not as conclusive as a positive one, because it does not mean in all cases that the organism is not infected. The cutaneous test fails often in chronic or emaciated cases of tuberculosis; it is lacking very often in the later stages of miliary tuberculosis and tuberculous meningitis. During the first week of measles the reactivity against tuberculin is lacking. In an individual who by a previous examination we know is tuberculous, we can make the diagnosis of measles or of a miliary tuberculosis by the negative reaction. The practical value of a test is not a very great one in adults, for the reason that so many are infected with tuberculosis, and that positive reaction, therefore, is very common. It should be applied only if we have a doubtful physical symptom, and we wish to know whether this organic lesion is of a tuberculous nature or not. An intense positive reaction speaks in favor of the tuberculous nature, but does not entirely decide the question. On the other hand, a negative reaction in two or three subsequent trials proves that the individual is not tuberculous at all, so it proves that the lesion in question is not tuberculous. In children, especially infants, the positive reaction alone without definite physical symptoms is already a serious warning, because we know that the infection of tuberculosis in the first years of life is in most case of a widespreading nature. The main questions which are to be decided with the cutaneous test in children are the following: chronic intestinal marasmus, bone lesions, emaciation, anemia, subacute bronchitis, glandular swelling, cases of furunculosis,

and a great many other skin lesions, and finally doubtful symptoms of a beginning meningitis.

Treatment of Tuberculosis in Children.—M. P. Nobécourt (*Jour. de Méd. de Paris*, March 15, 1910) says that rest, fresh air, and general hygiene are the keynotes in the treatment of tuberculosis in children. The question of climate, country, or seashore life is important, but secondary. Rest is absolutely necessary in articular tuberculosis, in febrile conditions, and in the period of cachexia. In other cases the dosage of rest must depend on the temperature, pulse, and general condition. Every tuberculous subject who is losing flesh or having fever must be kept in bed or in a reclining chair; in other cases repose is only relative, the patient taking several rests during the day interspersed with walks, all violent exercise being interdicted, or anything that will cause fatigue. Cerebral fatigue must be prevented as well as physical. Fresh air must be given all the time. Life in the city renders this impossible, since the air is more or less vitiated; life in the country must be substituted, but where is of little account, since cures may be obtained in all climates. It is of advantage to place the child so that he can have the proper fresh air and yet not have him separated from his parents. Fresh-air schools are valuable. Sea air seems to be especially favorable for joint tuberculosis, glandular affections, and peritonitis. It must be prolonged for months or years to effect a cure. In early pulmonary tuberculosis, especially when associated with tracheobronchial glandular affections, and in apyretic cases sea air still does good. It is in advanced febrile cases that mountain climates are preferable. Cold sea-baths are contraindicated in children under three years of age, and in nervous subjects whose reaction is poor; they may be given to those with closed external tuberculosis. In pulmonary cases they should be reserved. Warm baths in the tub may be given to all.

Gastroenteric Toxemias of Bottle-fed Infants in Summer.—J. A. Hulse (*Jour. Amer. Med. Assn.*, 1910, liv, 1125) outlines a number of general principles to be observed in the treatment of this infection. The withholding of all food for at least three days is imperative; after that time barley water may be given. The child should rest in bed out of doors. No child should be permitted to creep or to sit up even if apparently able to do so. The toxins should be eliminated by stomach washing, colonic irrigation, and catharsis. If the physician is called in early, there is no procedure so valuable as stomach washing, using boiled water at a temperature from 100 to 110° F., to which may be added a small quantity of lime-water. Two drams of castor oil should be given though the tube before its withdrawal—a thorough colonic irrigation should follow, and after the stomach is settled cooled boiled water may be given freely by the mouth. In cases seen a little later, stomach washing is not indicated unless that organ is irritable, but colonic irrigation should be

done every four hours the first day of treatment—after that twice daily is usually sufficient. This should be followed by nutritive enemata at intervals of four hours. The rectal feeding should be continued until it is safe to begin feeding by mouth. Of measures to control temperature and restlessness, a tub bath is the best. The child can be in the tub from ten to twenty minutes out of every two hours if necessary. An ice cap to the head is useful. The following measures may be used to allay the inflammation: In addition to rest in bed and after thorough cleansing of the alimentary canal, bismuth subnitrate may be given, from 1 to 2 drams daily, for a child one year old. Salol, 1 or 2 grains every three hours, is of some benefit as an intestinal antiseptic. Opium is indicated if there is much pain and continued frequent stools. It should not be given if cerebral symptoms and high temperature are present. For prostration, brandy should be administered by adding it to the boiled water, which the infant takes to allay thirst—1/2 ounce in twenty-four hours. Hypodermoclysis may be necessary in the graver cases. During convalescence tonics are indicated, and beef-juice should be given freely. Removal to the country or seashore in those cases in which relapses are prone to occur will accomplish more than anything else in restoring the infant to health.

Epidemic Cerebrospinal Meningitis.—J. Comby (*Arch. de méd. des enfants*, March, 1910) describes the epidemic of cerebrospinal meningitis which occurred in Paris and other parts of France in 1909. Up to 1909, during six years, the author had but sixteen cases in his hospital service, while in 1909 there were fifteen cases in five months. Of the first sixteen cases, treated with hot baths, lumbar puncture, intravenous, subcutaneous, or intrarachidian injections of electrargol, only four were cured. There were more cases in winter than in summer, inclement weather seeming to influence their appearance. Of the fifteen cases in 1909, the meningococcus was found in the cerebrospinal fluid in most cases, and in the cured cases it was found for a long time in the nasal mucous membrane. This persistence is dangerous to those who surround the carrier, and there are persons who, not having been sick, are carriers of the diplococcus intracellularis meningitidis. The symptomatology was very variable. Vomiting, headache, stiffness of the neck and back, moderate fever, herpes labialis, rarely convulsions, deafness and blindness, with persistence of intelligence were characteristic. This intellectual clearness contrasts with the coma of tuberculous meningitis. Constipation was frequent. The temperature is not a guide to either diagnosis or prognosis. It is often difficult to be certain of diagnosis without examination of the fluid removed by lumbar puncture. The fluid is milky, yellowish, and contains meningococci and polynuclear leukocytes. When improvement takes place, lymphocytes replace the polynuclears. In the series of fifteen cases treated in 1909, antimeningococcic serum was injected in fourteen; of these there were six deaths. Preventive

measures are cleansing of the nasopharynx of germ carriers with a solution containing iodine, guaiacol, and thymic acid used very hot as a douche, swabbing with a tampon of iodine and iodide of potash morning and evening, and gargling with hydrogen peroxide. By these means germs disappear in four days. Thirty-one cases are described. Contagion to those surrounding the patient seemed to be slight. The use of serum has lessened the mortality 20 per cent. Hot baths, ice to the head, and sedatives are indicated in addition.

Concomitant Lesions of the Nervous Centers in Cerebrospinal Meningitis.—H. Claude and P. Lejonne (*Gaz. des hôp.*, March 21 and 24, 1910) call attention to the symptoms of lesions of the cortex that accompany the lesions of cerebrospinal meningitis which belong to the meningitis itself. These symptoms are ascribed to the meningitis and are called sequelæ, while there is evidence that they result from lesions of the cerebral cortex which are not always situated on the surface of the brain contiguous to the meninges. The lesions depend on vascular changes and follow the lines of the vessels. Autopsy shows that there are sclerotic changes in the gray matter which account for the symptoms. Interesting illustrative cases are given by the authors. The inflammation of the gray matter may even have preceded that of the meninges, but it is difficult even when autopsy has occurred to tell which process was first to take place. By experiments of injection of chloride of zinc into the meninges of dogs it was shown by the authors that a hemorrhagic meningitis resulted, accompanied by hemorrhagic inflammation of the cortex, some nodules not being close to the meninges. These lesions described as sequelæ are more often really concomitant lesions. The symptoms of such manifestations are mental, motor troubles, such as flaccid or spastic paralysis, troubles of sensibility, muscular atrophy, ataxia, or asynergia, and changes in the organs of sense. It is of the utmost importance to establish the location and nature of the lesions in order to be able to give a prognosis as to recovery or the gradual increase of the process and symptoms. We must know whether the paralysis is due to peripheral nerve lesions, destruction of the anterior horns, or a focus of disseminated myelitis, constituting a definite, permanent lesion, or an affection of the nerve-roots, which will gradually be recovered from.

Meningitis.—In a paper on meningitis and conditions simulating it, F. S. Meara (*Arch. Ped.*, April, 1910) emphasizes the great predominance of the tuberculous type except during epidemics of cerebrospinal meningitis. The insidious onset may be one of several modes: 1. After a week of listlessness and fatigue, headache may begin, and a week later vomiting spells, with stupor still a week after these. 2. Listlessness, apathy, and in two or three days attacks of vomiting, and then increasing stupor. 3. Abrupt onset with a convulsion and fever while in full health. 4. Most commonly, listlessness and apathy merging into marked

stupor. The symptoms of prime importance are: Apathy, tremor, irregularity of respiration, ocular palsies. Stiffness of the muscles of the neck is more often absent than present in infants, but a moderate amount of retraction of the head may be noticed even without rigidity. Opisthotonos is extremely rare. Kernig's sign is usually absent. The knee-jerks vary greatly; are often absent, often increased. The scaphoid abdomen is not common. The vasomotor tache is almost constantly elicited and is marked. Local palsies occur from time to time; in the face most frequently, in the extremities much more rarely. Convulsions after the onset are the decided exception. Hyperesthesia varies a good deal and seems to be more common in the older children. The temperature is apt to be rather low, with considerable excursion. In older children the picture more nearly approximates that of cerebrospinal meningitis. The blood count in tuberculous meningitis has been found to deviate considerably from that obtained in other tuberculous conditions. The typical blood count in slowly advancing tuberculosis of one or other structure shows a leukopenia, a normal number or one but slightly increased, while in tuberculosis of the meninges there is usually a fairly marked increase. In thirty-two cases, the figures ran from 6,700 up to 38,000. Of the whole number, twenty-six, or 81 per cent., were over 13,000. The points to be remembered are that the total count and differential is higher than in other tuberculous conditions and that because high it cannot be differentiated from pyogenic conditions, nor yet is it to be considered as exclusive of tuberculosis of the meninges. Of all evidences of tuberculous meningitis, none are so certain as the recovery of the tubercle bacillus from the cerebrospinal fluid. The fluid comes out under pressure, spurting or flowing in a steady stream instead of drop by drop. It is increased in quantity, 30 to 45 to 60 c.c., and even more. The normal in infants is 10 to 20 c.c. and in older children 15 to 25 c.c. It is clear or slightly hazy or opalescent, sometimes quite markedly so. It forms on standing a characteristic spider-web coagulum, in the middle of the test-tube, from which, when it is teased out on a slide, the tubercle bacilli may be recovered. Sediment will readily yield the organism. The cells in the fluid are increased. In the normal fluid the cell count is rarely above 5 per c.mm. In tuberculous meningitis it is usually over 100 and even up to 1,000 per c.mm. Most of these are lymphocytes. In 50 of the writer's cases the tubercle bacillus was found in the spinal fluid of 47 or 94 per cent.

Lumbar Puncture in Meningitis and Allied Conditions.—G. S. Laudon (*Lancet*, April 16, 1910) bases his remarks upon four cases of anterior poliomyelitis, four of chronic hydrocephalus, several of so-called meningism, and fifty of meningitis. He says that in diagnosis lumbar puncture is of very great importance, the one conclusive result being the identification of a causal organism. With most of the tests a negative result may be

of little consequence, while positive results are of value, as they confirm one another and the clinical evidence. Therapeutically lumbar puncture has been disappointing, partly because too much was expected from it. Cures have been attributed to its repeated performance in various forms of meningitis, even tuberculous, with or without other treatment. In microbial meningitis it may do good by removing organisms and their toxins, and by removing an inert fluid with practically little or no opsonic and agglutinative properties and thereby causing the exudation of fresh fluid having greater protective powers. A vaccine may be prepared from the fluid or antiseptic injection employed. There is, however, the fact that many cases are too *foudroyant* to allow of opportunity for treatment, while others are so latent as to escape suspicion of the real nature of the condition until past interference. Meningitis associated with otitis often best lends itself to operative interference. The septic focus having been removed and the meninges drained, a cure has several times resulted. Encouraging results are reported as following the administration of urotropin in meningeal infection. The drug is said to be excreted in the spinal fluid in half to one hour after ingestion and to exert a marked antibacterial effect.

Cerebrospinal Meningitis Treated by Intraventricular Injections of Antimeningitis Serum.—Louis Fischer (*Pediatrics*, April, 1910) reports a case of cerebrospinal meningitis in an infant two months old in which the diagnosis was made by tapping the lateral ventricles after several negative spinal punctures. It was treated by intraventricular injections of Flexner's antimeningitis serum after aspiration of intraventricular fluid and irrigation with normal saline solution and complete recovery took place. Sixty-five c.c. of serum were used in three intraventricular injections. Seventy c.c. of fluid were aspirated during three intraventricular punctures. A fourth intraventricular puncture yielded a dry tap. Thirty-seven c.c. were injected in two sittings by the intraspinal route. Six lumbar punctures resulted in dry tap. In two lumbar punctures the writer aspirated a total of 6 c.c. of fluid resembling the serum injected, in which the meningococcus was absent. The value of nutrition must not be forgotten. This infant was nursed at the human breast, which in itself gave sufficient strength to aid in establishing normal conditions.

Treatment of Anterior Poliomyelitis by Muscle Training.—J. M. Berry and Bertha Van Denbergh (*Alb. Med. Ann.*, 1910, xxxi, 207) insist upon the value of muscle training in the treatment of paralysis following anterior poliomyelitis. Mechanical support by braces should be only an adjunct or preliminary to this. Voluntary movements, be they ever so slight, are of much more benefit in maintaining and building up nutrition in a muscle than is passive motion, electricity or even massage. Electricity is of undoubted value in maintaining the nutrition in muscles

that are temporarily paralyzed, but as soon as a muscle regains any of its voluntary activity there can be no question as to the greater efficacy of voluntary movements in maintaining and developing nutrition. Light massage, gentle manipulation and light percussion are very stimulating to the growth of muscle and are usually much more agreeable to the patient than the use of electricity. Sometimes it is found that the muscle power necessary to a certain movement is present, but the patient is unable to make the movement because he does not know how. In such a case the patient has to be assisted in the movement and after a time the association path in the brain will be reestablished. Resisted movements are sometimes found to bring out more voluntary control by the patient and are always excellent strength builders. Sometimes when a certain voluntary movement is absent in one limb but is present in the opposite limb it can be developed by instructing the patient to try and make the movement with both limbs. The muscle training must be of such a nature as to secure the interest and cooperation of the patient. Most of the patients are small children and the exercises are given in the form of gymnastic play. In giving the exercises of muscle training it is very important not to overtire the small patients. Twenty minutes to half an hour every day or three times a week is time enough to spend with any child.

Treatment of Paralytic Deformities.—R. W. Lovett (*Bost. Med. and Surg. Jour.*, 1910, clxii, 479) ascribes the greater success obtained at the Children's Hospital, Boston, recently, to certain changes in operative methods, more careful selection of cases, and greater care in the correction of deformity. Tendons have been inserted into periosteum, and tendon-to-tendon attachment has been abandoned. The use of silk extensions has proved satisfactory and has given an added range and flexibility to the operation. The transferred tendons have been attached with such tension that when the limb was held in the overcorrected position they were moderately tight. The period of fixation now in use is from six weeks to three months. After the fixation plaster is removed, a supporting brace is worn until six months or a year after operation. From the time of the removal of the fixation plaster, massage and muscle training of the transferred muscles is followed out in cases where the patients live near enough to the hospital to avail themselves of it. Simple operations have been preferred to complicated ones, and the splitting of a muscle and its use for two insertions has been largely abandoned and the entire muscle transplanted. The use of silk ligaments in the ankle-joint as supplementary to tendon transference has proved of the greatest value. In some instances the results are brilliant; in some, the extent and character of the paralysis prevent us from obtaining as good functional results as we would desire.

Failure of Nerve Anastomosis in Infantile Palsy.—W. B. Warrington and R. W. Murray (*Lancet*, April 2, 1910) record

their results from nerve anastomosis in five patients operated upon about three years ago, four of whom suffered from infantile palsy; in two the upper limb was affected, in two the lower. The fifth case was a traumatic lesion of the great sciatic nerve, due to a dislocation of the hip. In none of these cases has any improvement, the direct result of the anastomosis, resulted. Improvement due to the natural processes of repair in the cord was observed to a considerable degree, but it seemed in no wise to be connected with the actual surgical interference undertaken.

Electric Treatment of Infantile Paralysis.—A. Zimmern and Bordet (*Jour. de méd. de Paris*, April 16, 1910) state that the treatment of infantile paralysis by electricity is a rational one, and should be begun two weeks after the onset of the disease. It is the only method of obtaining exercise of the paralyzed muscles, and of the nonparalyzed ones to which there are no antagonists. Its use will prevent atrophy, will allow of regeneration of the still healthy muscular fibers, and will prevent anatomic changes in the joints and bony structures. Electrodiagnosis alone will tell which muscles can be regenerated. The lesions in the spinal cord are obliterations of vessels in certain foci, followed by necrobiosis. There is collateral edema and congestion. The form of electricity must be determined by the reaction of the various muscles. The sitting should be of an hour at least and exercise should alternate with rest. Each muscle must be picked out and caused to contract. The duration of treatment must be months or years in order to get the best effects.

Household and School Prophylaxis of Measles and Scarlatina.—Giuseppe Pecori (*Gaz. méd. di Roma*, March 1, 15, and April 1, 1910) states that it is his belief that disinfection in cases of measles after the disease is over is of very little value. The virulence of the germs is short lived, and the harm is all done before the case has been diagnosed or the child sent home from school. The hope of prophylaxis in this disease lies in the education of the public to isolate a child as soon as he shows any symptoms that may be referred to measles, and to keep him at home and isolated long enough for the contagion to have passed away. In scarlatina it is the nose and throat that contain the contagious germ, and it is rather doubtful whether the scales of the skin are in themselves contagious. They may become contaminated with the germs from the mouth of the child, and so may carry the discharge. Here, again, it is the complete and careful isolation of the child, and the disinfection of everything that he has used and of everything that his attendants have used, that will prevent contagion. This isolation must last for at least forty days in order to be effective, and must be absolute. The room in which the patient has been isolated must be carefully disinfected after he is well, and he should not be allowed to go to school for some time after he is well.

Fat Percentages in Infant-feeding.—In feeding 600 babies,

A. S. Bleyer (*Arch. Ped.*, March, 1910) has observed that if the fats are reduced to below 1 per cent. the child becomes hungry, regardless of a reasonable increase in proteids. If the fats are removed a normal child will be hungry in about an hour and a half. In an infant who is vomiting massive curds it is customary to reduce the caseins or to alkalinize the milk. The writer believes that the caseins offer little difficulty in the vomiting of babies provided the fats do not interfere. While it is quite generally believed that babies fed on low fat percentages suffer from constipation, the writer reports twenty out of twenty-eight cases which had at least one stool every day, while a number of them had diarrhea.

Short Course Pneumonia in Children.—Le Grand Kerr (*Med. Rec.*, April 23, 1910) claims that lobar pneumonia may be of very short duration in childhood, ending by crisis within seventy-two, forty-eight, or even twenty-four hours. He quotes the histories of a number of typical lobar pneumonias in children to show the possibility of making a correct diagnosis from the early symptoms, and says that if it is possible to diagnose lobar pneumonia upon the first day of the disease and have all doubt as to error dissipated by the subsequent typical course of stages of congestion, hepatization, and resolution, it is possible by the same signs to diagnose pneumonia, even if the disease be arrested some time during the first stage. He gives the histories of several of these cases of apparently short-course pneumonias.

Linear and Subperiosteal Fractures of the Long Bones in Children.—W. P. Cones (*Jour. Amer. Med. Assn.*, 1910, liv, 1204) says that definite, localized, and well-marked points of tenderness may be found in most cases of linear cracks and subperiosteal fractures in children if long, careful search is made for them. Such findings, with increase of pain on pressure and rotation with all the classic signs of fracture absent, generally mean a slight linear fracture. A diagnosis can in most cases be made clinically. An anesthetic will not help in the diagnosis of these fractures. A radiograph should be taken whenever possible. In all cases of injury, in which fractures of this nature are suspected, the bony landmarks are in perfect position and there is no displacement; rough manipulation and forcible testing for crepitus are uncalled for and may do harm by increasing the fracture, which, as the position is perfect, we should avoid particularly. In these cases children often complain of pain and trouble at a distance from the real seat of fracture. The x-ray examination should not be confined to the part complained of, but should include the neighboring long bones as well.

Perigastric Adhesions Simulating Pyloric Stenosis in an Infant.—C. C. Grulee and J. E. Kelley (*Surg. Gyn. Obst.*, April, 1910) record a case with vomiting beginning on the fifth day of life, at first slight but gradually becoming very severe and occurring no matter what the food ingested might be. The vomiting occurred usually immediately after eating, but was sometimes delayed as

long as a half hour. This vomiting was almost immediately relieved by division of adhesions between the pylorus, upper portion of the duodenum, and hepatic flexure of the colon. The vomitus at first consisted of unchanged milk, or at times curdled, but later it was bile-stained, a condition very infrequently encountered in true pyloric stenosis in the infant. The peristaltic waves differed in no way from those of pyloric stenosis, but the involvement of the colon in this action was so suggestive that the presence or adhesions was suspected.

Dermatoses and Puberty.—Paul Dalché and C. Fouquet (*La Gyn.*, March, 1910) enumerate the many forms of skin disease that may accompany puberty. Many of them appear for the first time at puberty, and are connected with the establishment of the genito-urinary functions. During the time from twelve to fifteen years of age all the organs undergo hyperfunction, growth ends, and the child becomes individualized intellectually and morally. Some of the skin manifestations are normal some pathological. Normally, the growth of hair increases, and the function of the fat and sweat glands is increased. There are various causes for the skin troubles, but all act on a predisposed organism, arthritic and nervous heredity making them worse. The causes given are gastrointestinal, congestion of the skin, and internal secretion of the ovaries, thyroids, and uterus. They act through the medium of the nervous system, sometimes by direct action of the endings of the nerves in the skin, sometimes on the nerves of the cutaneous vessels. The eruptions may precede or accompany the first menstruation, and reappear at each repetition of it. They may replace the dysmenorrhea, or may occur all of the time without reference to the time of the period. The pilo-sebaceous system may be insufficient or too active; in the first case we have keratosis, in the second oily seborrhea. Acne of various degrees is frequent. Milium and moluscum contagiosus occur less frequently. Urticaria and edemas are seen. Pruritus is a nervous reaction, an exaggeration of the normal elementary cutaneous sensations. Herpes is more frequent, every period being signalized by the appearance of vesicles. Eczema or psoriasis indicates a diathetic condition. Opothrapy is the measure that will meet with good results in these conditions. General tonics and hygiene, and fresh air are of great importance.

Trichocephaliasis and Trichocephaloanemia.—Guido Guidi (*Riv. di clin. ped.*, March, 1910) describes a form of simple anemia that is produced in children by the presence of trichocephalus in the intestine. It results from hemorrhage from small ulcerations in the intestine, from absorption of toxic products of the life of the parasite, and from failure of nutrition and metabolism. The symptoms are general weakness, vomiting, diarrhea, hemorrhage, fever, and pain in the abdomen. The blood gives evidence of less hemoglobin, leukocytosis, presence of nucleated red blood cells, poikilocytosis, hyperglobulia, macro- and microcytosis,

and possible eosinophilia. The parasite is received by drinking water, by eating vegetables watered with sewage, and by handling materials containing the eggs of the parasite. The worm is in general innocuous, but in children it sometimes brings about this condition of marked anemia.

Helminthiasis in Children.—In his examinations of children in clinics in New York City, O. M. Schloss (*Amer. Jour. Med. Sci.*, May, 1910) found that twelve of thirty children who suffered from unexplained nervous or gastrointestinal symptoms were found to harbor intestinal worms. Consecutive examinations of 280 children showed that eighty (28.57 per cent.) harbored intestinal worms. Five of the children harbored two species of parasite, giving a total of eighty-five infections. Thirty-one (11.07 per cent.) of the children harbored *Trichuris trichiura*, twenty-three (8.21 per cent.) harbored *Oxyuris vermicularis*, twenty (7.14 per cent.) harbored *Hymenolepis nana*, six (2.14 per cent.) were infected with *Ascaris lumbricoides*, and five (1.78 per cent.) with *Tenia saginata*. Only one of thirty-three children infected with *Trichuris trichiura* (from both groups of examinations) suffered from symptoms. Thirty-five of the fifty-one children infected with the other parasites (from the consecutive examinations) suffered from symptoms. The eosinophile blood cells were not increased in cases infected with *Trichuris trichiura*. In infections with the other parasites eosinophilia was usually absent when there were no symptoms due to helminthiasis. Eosinophilia was generally present in cases which presented symptoms of helminthiasis.

Use of Lactose in Dietetics of Infants.—M. Péhu and C. Porcher (*Lyon méd.*, May 8, 1910) say that in milk there is but one carbohydrate material, lactose. This is a sugar which is entirely consumed in the organism of the infant, being converted by lactase found in the intestine into CO_2 and H_2O . It is of pure animal origin. Lactase does not exist in the mucosa of the stomach, but only in the intestine; in young animals lactase is much more abundant than in adults. No sugar is found in the feces or urine of young infants, showing that the sugar is all used up in the body. Its use as a medication causes a laxative effect, a mild diarrhea occurring if it is given in too large doses. The use of lactose is of great value in the alimentation of the young child. The quantity that should be given daily is 18 to 36 grams, and it may be mixed with the milk or with other liquid foods. There are different degrees of tolerance of this sugar among infants. It should be given with care in the summer on account of the liability to produce diarrhea. It is a very powerful agent for regulating the intestinal action, unirritating, modifying the consistence of the stools, and rendering their expulsion easy. It causes an increase in weight. The author made a test of its use in seventy infants in various crèches, during a period of six months, with good results.

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ORIGINAL COMMUNICATIONS.

THE SURGICAL TREATMENT OF VAGINAL DELIVERY.*

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THE obstetrical management of labor consists essentially in the delivery of the child. It is not long ago that the obstetrician contented himself with this and with such repair of lacerations and management of hemorrhage as the lack of antiseptic facilities made possible. As a result of this condition of affairs it was not uncommon for women to pass through labor, sustaining severe lacerations and suffering from more or less hemorrhage afterward.

When antisepsis and asepsis were adopted, obstetric surgery was perhaps the last branch to develop under these new conditions. Success in abdominal surgery led to the revival of Cesarean section. Antisepsis made possible symphysiotomy with better results than had previously been obtained. Vaginal Cesarean section was added to the list of operations, pubiotomy has received an extensive trial, and suprasymphyseal section is now under consideration.

The success of these operations has depended, not only upon antisepsis and asepsis, but upon the application of surgical principles to the management of parturition.

The two foes which the surgeon most dreads are hemorrhage

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and septic infection. He further considers no operation complete which does not leave the patient's tissues as thoroughly repaired as her vital condition will permit. The major obstetric operations have been successful in proportion as hemorrhage and septic infection were avoided and the patient left in sound condition.

In the various forms of Cesarean section upon uninfected patients, the operator closes all wounds and usually obtains primary healing. Upon infected patients, the Porro operation and the suprasymphyseal uterine fistula carry out the surgical principle of drainage and the shutting off of infected tissues from the peritoneal cavity.

Vaginal delivery by forceps, version and extraction, or craniotomy have not been as thoroughly performed under surgical principles as have the major operations. Observation shows that obstetric disasters usually originate in difficult vaginal delivery under imperfect surgical technic.

The purpose of this paper is to record experiences in the surgical treatment of vaginal delivery and to elicit discussion upon this point.

We must admit that surgical operations are the substitution of a lesser evil for a greater. A surgical operation is rarely welcomed, usually dreaded, and becomes acceptable only when the surgeon and what he does are considered less dangerous than the disease or condition for which operation is performed. In our efforts to protect parturient women from the consequences of difficult vaginal delivery we must be sure that what we do lessens and not increases the danger.

It is obvious that we are not discussing normal labor, which is possible only in normal individuals. Nature's mechanism for protection against hemorrhage and infection in normal labor is so perfect that nothing but a positive indication should lead to interference.

In the endeavor to protect the parturient woman from hemorrhage the value of prophylaxis must not be forgotten. As hemorrhage often follows uterine relaxation, and this is caused by exhaustion, if we would protect the patient from hemorrhage, she must not be allowed to become exhausted. A correct diagnosis of the comparative size of mother and child and the mechanism of labor present will prevent the fatal delay in impossible labor. But although the conditions may render vaginal delivery possible, we see many patients whose strength is limited

and who, in spite of prophylactic treatment, become exhausted in the second stage of labor.

In dealing with these cases one must not only avoid the exhaustion which precedes relaxation of the uterine muscle, but also prevent as far as possible the occurrence of lacerations. Full dilatation of the cervix is recognized as a most important prerequisite for successful vaginal delivery. This must be obtained whenever possible by the preservation of the membranes in primiparous women. Dilatation of the cervix and vagina by bags is most successful in many cases. In others, this method converts a favorable into an unfavorable mechanism, causes severe suffering, and predisposes to exhaustion. Manual dilatation under ether preceding delivery is often more efficient and less distressing and exhausting to the patient.

The delivery accomplished, the necessity for immediate removal of the placenta may not always be present, although the patient has failed to deliver herself. If she be allowed to come partly from the influence of ether, and if tonic doses of strychnia and ergot are given hypodermically, as soon as the child is delivered the uterus will usually contract sufficiently to detach the placenta and bring it within convenient reach of the obstetrician. Should, however, partial placental separation occur with hemorrhage, the placenta should immediately be separated and delivered by the gloved hand.

The uterus having been emptied and brought to contraction and controlled by the hand of an assistant, the question next arises in the mind of the operator: Is relaxation likely to return, and shall anything be done to make this practically impossible?

I realize fully that the introduction of the hand, instrument, or foreign body within the uterus, is to be avoided. We formerly regarded the interior of the uterus in labor with as much dread as the peritoneal cavity, but in my experience it is safer, under antiseptic precautions, to take measures to prevent relaxation of the uterus than to omit those precautions and some time later treat postpartum hemorrhage. In my experience, in cases where relaxation may reasonably be expected, and hemorrhage feared, the emptying of the uterus should be followed by irrigation with salt solution, or one per cent. lysol, and thorough tamponing of the cavity with 10 per cent. iodoform gauze. This manipulation may be done in two ways, depending upon the number of assistants available for the operator. Where more than one assistant, having sterile hands, are present, the two lips

of the cervix may be grasped separately by tenaculum forceps, drawing them down to the vulva, and gauze packing introduced under direct vision. If such assistance is not available the left hand of the operator may be introduced within the vagina at the cervix, the fundus being brought downward and forward by the hand of the anesthetizer placed upon the abdomen. The gauze is then introduced into the cervix with dressing forceps and is packed to the fundus by the fingers of the left hand of the operator. Bumm has drawn our attention, in his excellent illustrations, to the danger of tamponing the lower uterine segment only and leaving the upper expulsive segment empty for the accumulation of clotted blood. This error can be avoided by either of the methods described. Hemorrhage from the body of the womb is usually promptly controlled by this method. In cases of extreme exhaustion the gauze may be wrung out of adrenalin 1:1,000, and then introduced.

Hemorrhage from the genital tract persisting after the body of the uterus is tamponed occurs from laceration. The value of suture of the cervix in checking such bleeding has long been recognized, and I need not detain you by dwelling on this point. So, hemorrhage from the deep lacerations of the segments of the pelvic floor is promptly controlled by suture. In some cases the anterior segment of the pelvic floor may be torn sufficiently deeply to cause persistent arterial bleeding, which may not be detected until this portion of the genital tract is examined under a good light.

I am well aware of the fact that if such prophylactic treatment be carried out the obstetrician will tampon some uteri unnecessarily, but I have yet to observe a case in my own experience and that of those who work with me in which septic infection or perforation of the uterus has occurred as a result of this method, and in my experience it is a lesser risk than the treatment of postpartum hemorrhage an indefinite time after labor by hot douching, the introduction of vinegar, and the attempt to tampon the uterus when the patient is not under an anesthetic.

We all, I think, recognize the importance of hemorrhage as predisposing to septic infection. Its prevention, then, is directly in the line of antisepsis. Next in importance in preventing sepsis is the detection and immediate closure of lacerations. By the term "laceration" we do not refer to solutions in continuity of the mucous membrane only, but to such tears as penetrate the submucous tissue, opening blood-vessels and lymphatics.

The occurrence of severe hemorrhage from torn vessels in the cervix has suggested to obstetricians the control of such bleeding by immediate suture. In the writer's experience, primary union often occurred in such cases, and if this was observed when suture was performed for hemorrhage, why should union not occur when suture was performed for lacerations without considerable hemorrhage? For some time we have made it a rule to immediately suture, when the vital condition of the patient permitted it, lacerations of the cervix extending nearly or to the vaginal junction. This practice has been applied among hospital and private patients by the staff of the Jefferson Maternity. While I have not obtained our latest statistics as to the number of cases, they aggregate several hundred; and a careful analysis of this work a few years ago gave 80 per cent. of complete primary union of the cervix after immediate suture, 10 per cent. of partial union, and 10 per cent. of failures. In none of these cases did infection occur. The preliminary uterine packing with gauze was employed in these cases wherever laceration was extensive. This undoubtedly contributed to the success of the suture, for in some reported cases of repair infection followed cervical suture from the retention of the lochial discharge and imperfect drainage of the uterus. As the gauze packing remains for forty-eight hours, the uterine sinuses become firmly closed, drainage is established, and the risk of infection is certainly less than if the tampon had not been applied.

In considering the closure of the torn cervix after labor, we do not attempt a complete anatomical restoration to the unimpregnated cervix, nor do we believe that such restoration is of practical value to the woman liable to repeated parturition. The cervix should be closed, however, to within half an inch, or in favorable cases quarter of an inch of the external os. The remaining portion will close sufficiently to render the involution of the cervix practically complete, and the cervix is less likely to tear in subsequent labor.

In cases of severe laceration through the cervix and into the fascia of the posterior segment of the pelvic floor, the closure of the upper extremity of such laceration is of special importance. These stitches may embrace some of the tissue forming the sacral ligaments and, by restoring the parts, tend to draw the cervix backward, thus preventing retroversion. While these stitches are not easy to pass, their importance justifies the effort.

The method of closing the anterior and posterior segments

of the pelvic floor is familiar and requires no special description. Tears in the sulci and fascia of the levator ani muscle are of primary importance. Next comes the sphincter and its surrounding fascia, even though the tear has not extended into the bowel. If these two regions have received attention, the perineum may be closed in such a way as to carry the posterior vaginal wall upward and backward, thus preventing rectocele and prolapse.

In our experience, lacerations of the anterior segment should not be neglected. Not only do they cause hemorrhage, but tend to prolapse of the anterior vaginal wall and tissues about the urethra.

While it may be interesting to discuss surgical operations before specialists, who usually operate in hospitals, the practical question arises as to the application of such methods to confinement cases in private houses. Is this possible with safety to the patient and without unduly increasing the burden of her expense? What apparatus and assistants are necessary for such procedures?

Unquestionably, difficult vaginal deliveries should, if possible, be conducted in hospitals. Primiparous patients should, as a rule, be confined in hospitals. The number of women who seek hospital care in labor is constantly increasing, and no large general hospital provided with facilities for surgical work should hesitate to receive a confinement case. The fear that the confinement case will become infected in a general hospital by reason of the surroundings of the hospital does not obtain in the present stage of hospital hygiene and antisepsis. At the Jefferson General Hospital I frequently deliver private cases by forceps or version, the patient occupying afterward a private room, with excellent results. Delivery is accomplished in a small operating-room reserved for clean cases, from which the patient is transferred to her own room.

In private houses the operator must transport sufficient appliances to establish and maintain antisepsis and aseptic technic. Edgar has shown us most completely how instruments and apparatus may be available at all times for such a purpose. In my own experience, my outfit contains a portable sterilizer in which the necessary instruments, suture, and ligature material are boiled just before being used. Sterile linen for covering the patient's lower extremities and abdomen, sterile gowns for the operator and assisting nurse, gauze for packing in sealed bottles are also available. The anesthetizer is considered a most important assistant, and should not only have at his disposal ether

and chloroform, but instruments and apparatus for hypodermic stimulation, and intravenous saline transfusion. In addition to the nurse who has charge of the patient, a nurse whose time is given to the preparation of dressings and supplies and the care of instruments accompanies the operator. It is her duty to boil the instruments, see that the sterile packages of linen and dressings are in readiness, boil a douche bag, assist at the delivery, and thread needles and assist at the repair of lacerations. This nurse is provided with sterile gloves and a sterile gown. The nurse in charge of the patient assists at the delivery, prepares the patient for delivery, and looks after the child. This makes a total of four medical persons required for obstetric operations in private houses. Additional assistants are often convenient and useful, but in ordinary cases they cannot readily be obtained. The patient's lower extremities can be kept in position by the use of a sheet folded in the longest way, passed beneath the neck, and tied to each leg on the outer side below the knee. An operating table may be carried by the operator, or improvised with the kitchen table. If the patient will use a high, single bed, with four wooden cubical blocks eight inches in diameter, which are to be placed under the legs of the bed thus raising it sufficiently high, it will enable the operator to perform vaginal delivery with comparative comfort. This is often less formidable to the patient and her friends than the transference to an operating table. Such a high bed is most convenient for the nurse, during convalescence.

In performing such operations, our reliance must be placed more upon asepsis than upon antisepsis as regards the patient. While the external parts should be thoroughly prepared with soap, sterile water, and bichloride, we limit vaginal douching to a single irrigation with lysol, 1 per cent. After delivery the uterus and vagina are thoroughly but gently irrigated with 1 per cent. lysol, and in addition to the uterine tamponing the vagina is moderately tamponed with bichloride gauze. The gauze is removed forty-eight hours after delivery, and the genital tract, including the uterus, thoroughly irrigated with 1 per cent. lysol. No other douches are given during the puerperal period. In the after-care of the patient, dilute bichloride solution or lysol is poured over the stitches as often as necessary. Sterile or bichloride gauze dressings are employed. The suture material is twenty-day chromicized catgut for all tissues except the skin in which silkworm gut is employed. To maintain a

tonic condition of the uterine muscle, strychnia and ergot are given through the first week or ten days of the puerperal period.

The steps of such an operation may be defined as anesthesia, placing the patient in position, catheterizing under anesthesia, thorough vaginal examination under anesthesia, irrigation of the vagina, delivery, the delivery of the placenta, irrigation and tamponing of the uterus, closure of the lacerations of the cervix, posterior pelvic segment and perineum, and anterior pelvic segment.

The tamponing of the vagina with bichloride gauze completes the operation. The time occupied for such delivery in private houses is on the average not more than one hour. Of this the actual delivery of the child takes about one-third of the time. The remainder is occupied in preventing hemorrhage, closing lacerations, and maintaining asepsis.

In private patients, concerning whom this paper is especially written, I have had two failures in closure of the pelvic floor. In both of these, the stitches in the sphincter and its fascia tore out during the first week of the puerperal period, because the patient strained upon the bedpan during movements of the bowel. In both of these patients it was necessary to perform a secondary operation to restore the functions of the sphincter. These operations were successful. Other than these, there have been no complications in these cases. Infection has not developed, 80 per cent. of cervical lacerations closed, 10 per cent. united partially, and 10 per cent. failed to unite. In some of those apparent failures, thorough examination with a speculum revealed the fact that the stitches placed the highest up had been successful, and that the vaginal portion of the cervix had healed at the upper extremity, leaving the lower two-thirds of the cervix without union.

It is now recognized that after vaginal Cesarean section and pubiotomy, incisions and lacerations in the cervix, pelvic floor, and perineum should be immediately repaired under antiseptic precautions.

Why should not other cases of vaginal delivery in which lacerations occur, and in which hemorrhage and sepsis threaten, be treated upon surgical principles?

ECTOPIC GESTATION FROM THE STANDPOINT OF
THE GENERAL PRACTITIONER.*WITH ESPECIAL REFERENCE TO THE APPENDIX AS A
CAUSAL FACTOR.

BY

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I CANNOT but feel that apologies are in order for bringing before this Society a subject in which the experience of many of my listeners has so far exceeded my own. At the New Orleans meeting of our Southern Surgical and Gynecological Society, in 1907, Dr. Boldt presented an exhaustive paper on "The Diagnosis of Extrauterine Pregnancy" ("The Archives of Diagnosis," 1908) based on an experience with nearly three hundred cases. I have nothing to compare with such wealth of material and yet I have been struck from the time of my first experience with this disease with the infrequency of accurate and timely diagnosis and, on the other hand, with the almost universal occurrence of symptoms which should lead the physician to at least suspect the presence of an ectopic pregnancy. I well remember our experiences on Dr. Kelly's staff at the Johns Hopkins Hospital. With the usual tendency for diseases to occur in groups we would go for weeks perhaps without a case of ectopic pregnancy. Then several cases would come into the house within a few days or weeks. The first of these would almost surely be undiagnosed as an ectopic pregnancy until operated on. The remaining two or three cases would be diagnosed. Was it the fault of the symptoms in the first case? Not at all. After the patient's recovery from the operation we could practically always get points in the history that made the interne ashamed of having erred in the diagnosis. Or in some cases the interne already had sufficient data on his history sheets, but the operator failed to put the facts together in a way to spell ectopic pregnancy. The entire staff would then be on the alert and the next few cases would be correctly diagnosed.

At the meeting of this Section of the American Medical Association at Atlantic City in June, 1907, I was criticised for making

*Read before the Section on Obstetrics and Gynecology of the New York Academy of Medicine, April 28, 1910.

the statement that "there is no serious intraabdominal condition which has the diagnosis written all over its face any more plainly than has extrauterine pregnancy, and at the same time no condition which is more often overlooked by the internist." Further experience only confirms these views, and my paper to-night has nothing of the spirit of fault-finding with the general practitioner, but is presented in the hope that discussion may be provoked and that as a result both general practitioner and surgeon may be more alert to a condition that should be diagnosed with greater regularity.

Whenever the statement is made in a medical meeting that the diagnosis of tubal pregnancy is easy in the majority of cases, there are always present those who can cite cases to refute such a statement. The last case of ectopic pregnancy I operated on failed to give the most typical symptom, viz., the missing of a period. She was twenty-six years old, had been married two years, and had never been pregnant. She had menstruated regularly. Her last period had occurred on time eight weeks previously, and when the period had almost ceased she was whitewashing and reaching up, and thought she strained herself, for her period began again rather more profusely than at first and pain similar to that suffered for some months in the left pelvis became more severe. After two weeks of bleeding her physician curetted, but she continued to bleed during the five weeks from this curetment until I saw her.

The fact that a woman who had always been regular was bleeding out of time and the fact that her physician had curetted her were two items to make me think at once of ectopic pregnancy. On examination I found the uterus slightly enlarged, and broadly continuous with its left wall was a rounded, firm, sensitive mass, movable only with the uterus. My diagnoses in order of probability were tuboovarian inflammatory mass, fibroid of the uterus, interstitial pregnancy. Operation showed a left tubal pregnancy with leakage into the folds of the left broad ligament. In this case no history could be obtained of any sharp, colicky pain or of any fainting attack, symptoms so common to tubal rupture or abortion. The bleeding had probably been gradual and its amount had been restricted by the broad ligament.

Another case to remind us that the general practitioner cannot always depend for his diagnosis on the text-book picture of ectopic pregnancy was seen with Dr. Preston Miller, of Hagers-

town. The patient had married ten days after her regular period, and sixteen days after marriage, or at about the time for her next regular period, she had a rupture of a tubal pregnancy. Her first symptom was a desire to go to stool. While there she had a fainting attack, and on the doctor's arrival she was found cold and cyanosed. Menstrual bleeding began with this attack and the doctor thought the husband had been giving her drugs to bring on a miscarriage. She had two similar attacks within the next two weeks, when Dr. Miller recognized the probable condition, and I was called and operated for a tubal pregnancy which had ruptured at the isthmus of the tube and resulted in a large encapsulated blood-clot.

I could cite other atypical cases and I am sure many of you have seen a variety of such, but these atypical cases do not nullify our main contention that most ectopic pregnancy cases have a history furnishing presumptive evidence of the abnormal condition, and the diagnosis and operation should occur in the pretragic, or what Philander Harris ("The Early Diagnosis of Tubal Pregnancy," *J. A. M. A.*, 1907, xlix, 1103) calls the non-tragic stage of the disease.

One chief reason why the family physician so often fails to make a diagnosis in the pretragic stage is the fact that the patient is not greatly disturbed over her condition. Given an acute attack of appendicitis or of gallstone or renal colic, and both patient and physician get busy at once in a quest for a diagnosis. In the typical case of ectopic pregnancy the missed menstrual period is taken as evidence of pregnancy. When the spotting begins it is too often considered a sign of threatened abortion. There may be no discomfort or pain or the patient may complain of a sense of fullness or pressure in one side. Later the pain may be of a more or less constant boring character due to the stretching of the tube by the growing fetus or there may be repeated sharp attacks due to oozing from the end of the tube or to slight leakage into or through an eroded tubal wall. Uterine cramps and the passage of "pieces of flesh," the uterine decidua, clinch the idea of abortion in the minds of both patient and physician.

Undoubtedly there are many women with extrauterine pregnancy who never even consult a physician and never have serious difficulties. The changes in the circulation may early rob the fetus of its blood supply, resulting in death and absorption. We have probably all seen cases who refused operation

in spite of dire warnings and we have been surprised to learn afterward that the patient had no further serious symptoms.

If the case follows its usual course, we finally see the terrible picture in which a knife-like pain which marks the tubal abortion or rupture is quickly followed by an agonizing peritonitis pain, which by the time the physician arrives may be referred entirely to the diaphragmatic region. This pain often strikes the patient while at stool. The patient feels a rectal pressure or desire to stool and while making the effort the rupture or abortion takes place and she faints because of the pain, or possibly leaves the toilet-room and suddenly grows dizzy and faints on her way to the bedroom because of the pain and internal loss of blood. When found by relatives she is blanched, fully or partially unconscious, pulseless at the wrists, and is supposed to be dying. By the time the physician arrives she has perhaps recovered from the first collapse, has some color in her lips, a fairly good but rapid pulse, and is able to give an accurate account of her experience.

With such a history of rectal tenesmus, sudden agonizing pain, and collapse symptoms the physician must make a diagnosis between ureteral calculus, appendicitis, and ectopic pregnancy, a thing not always easy to do. The urine will show blood if the case is one of calculus. Unfortunately it may show blood in appendix cases as I have shown in a previous paper ("Acute Pyelitis Due to Acute Appendicitis," *J. A. M. A.*, 1908, 1, p. 1328). We know how variable appendix cases may be as regards reflected pain. In ectopic pregnancy with rupture we can usually elicit a previous history of a missed period and of recent intramenstrual show and a history of recent pressure or boring pain, and we have the present evidence in many cases of severe hemorrhage, such as pallor, empty rapid pulse, air hunger, abdominal distention, and dullness in the flanks.

The patient should not be disturbed to test for movable dullness and the physician should be most careful in making a vaginal examination. If this is done at all it should not be an attempt at bimanual examination. With one finger in the vagina or rectum, fluid or a mass can be detected in the pelvis, and no attempt should be made to outline this mass for fear of stirring up renewed hemorrhage.

If the rupture has taken place posteriorly into the folds of the broad ligament the first collapse symptoms may be terrifying, but the recovery is more prompt and the signs of hemorrhage not so marked.

In cases of tubal abortion or rupture in the outer half of the tube the hemorrhage may not be so large and it may soon become encapsulated in the pouch of Douglas.

Too often the patient's idea that she is pregnant and is having an abortion is grasped by the physician, and as she continues to bleed from the uterus a curettage is decided upon. Fortunately this is usually done some days after a rupture, and nature has had time to encapsulate the blood and in this way protect the patient from renewed and fatal hemorrhage.

Treatment.—While ectopic pregnancy interests the general practitioner mainly from the standpoint of diagnosis, he is naturally concerned with the question of treatment as well. While we may have seen cases, both unruptured and ruptured, refuse treatment and do perfectly well, those who have had a wide experience have seen cases refuse treatment and die as a consequence. To my mind there can scarcely be an argument against operation if the case is seen before rupture. Cases seen after rupture should likewise have operative treatment if in suitable physical condition.

The point of greatest difference between surgeons to-day is whether to operate at once on cases in extreme shock from hemorrhage.

I am familiar with the excellent experimental work of Hunter Robb (AMER. JOUR. OBST., 1907, lvi, p. 6) and with the convincing paper by Simpson, of Pittsburg (*Surg. Gyn. and Obst.*, 1907, v, 503), advocating the hibernation treatment in all cases of rupture and shock. Personally, I prefer not to lay down hard-and-fast rules for myself or others. If the patient can be operated on with good surroundings and is in a condition that promises survival from operation, I prefer early operation rather than run the risks of repeated hemorrhage.

If a surgeon of wide experience and surroundings which insure a rapid and clean operation cannot be had, I am certain that the hibernation treatment will result in the greatest saving of life.

Etiology.—It is generally considered that ectopic gestation is due to some mechanical obstruction to the descent of the ovum, usually to an inflammatory kink (perisalpingitis) or swelling (endosalpingitis) which partially or completely blocks the lumen of the tube.

Other causes commonly ascribed are fibroid tumors of the uterus compressing the lumen at the tubouterine junction,

diverticula from the lumen of the tube (Willams, *Am. Jour. Med. Sc.*, Oct., 1891), and accessory ostia (Rokitansky, *Allg. Wien. med. Zeit.*, 1859, 32). As pointed out by Bandler in 1902, (*AMER. JOUR. OBST.*), inflammatory disease is undoubtedly the chief cause of tubal pregnancy. Glitch (*Archiv. of Gyn.*, Bd. 1x, p. 385), after a review of the literature and an analysis of forty-five cases occurring in Walcher's clinic in Stuttgart, concludes that gonorrhea is the underlying factor in a majority of the cases. In recent literature there have been reported a number of cases of ectopic pregnancy associated with, and apparently due to, appendicitis, but so far as I know there has been no systematic review of a series of cases to ascertain the possible frequency of this relationship.

Anspach (*University of Pennsylvania Medical Bulletin*, July, 1902) reported a case of tubal pregnancy associated with a tuberculous salpingitis in which the patient had suffered attacks of appendicitis for seven years. He reviews some of the literature concerning the relationship between appendicitis and right adnexal disease, and the part played in this relationship by Clado's appendiculo-ovarian ligament.

While the lymphatics of this ligament undoubtedly carry infection between its terminal organs, we need not invoke its offices for all cases of salpingitis secondary to appendicitis.

How often we see mild pelvic peritonitis involving every portion of the pelvic peritoneum after even mild appendicitis attacks.

Fortunately nature takes care of most of these adhesions, but I believe that the perisalpingitis thus engendered often leaves angulations in the tubes which become one of the most, if not the most, important factors in the causation of ectopic pregnancy.

Of the thirty-four cases of ectopic pregnancy in my private records the appendix was not mentioned in thirteen cases, five of these having been vaginal operations. In three cases it was considered normal and in eighteen cases diseased.

I realize the shortcomings of a macroscopic examination, particularly in some of the cases of tubal rupture in which the appendix might have been inflamed secondarily. In the majority of the cases, however, there was a history pointing to appendix disease or there were well-marked changes of a chronic character in the appendix and its neighborhood.

Frequency.—Ectopic pregnancy is comparatively rare and yet of such frequent occurrence that the physician should al-

ways bear it in mind in dealing with a case of atypical bleeding of recent origin in a woman for whom early pregnancy is a possibility.

During my service at the Johns Hopkins Hospital there were 3,300 patients on the gynecological service and but thirty-six cases of pregnancy outside of the uterus. Among my private notes on 2,100 cases I find records of thirty-four cases of ectopic gestation. Thirty-one of these were tubal, one interstitial, one true ovarian, and one abdominal. Two of the cases had been operated on by other surgeons for ruptured tubal pregnancy of the opposite tube. Eight of my thirty-four cases were diagnosed before rupture, an unusually large percentage, and due largely to the alertness of the general practitioner. We have too long satisfied ourselves with the statement that ectopic pregnancy can seldom be diagnosed until the tragic stage is on. It is the duty of this and similar societies to teach that the majority of ectopic pregnancy cases should be recognized in the pretragic stage, and that this depends largely upon accurate history taking by the general practitioner.

Of my eight cases diagnosed before rupture six were operated on in the unruptured state. One ruptured while she was getting ready to go to the hospital and one was ruptured after anesthesia in spite of my warning to the assistants to examine her with extreme care.

By diagnosis before rupture I mean diagnosis in those cases in which there have been no symptoms of rupture or leakage with peritonitis as evidenced by the sudden sharp agonizing pain, and in which at operation the tubal contents are found macroscopically intact. In some of these one finds a small trace of fresh blood in the pelvis which is manifestly due to the rough handling just before operation.

With the classification of some authors the case I have just mentioned as having ruptured while preparing to go to the hospital would not come under the ruptured class as she had but little blood in the pelvis when operated on one hour after rupture. I had examined her twelve hours before and diagnosed unruptured tubal pregnancy because she had missed her last period for one week and had been bleeding for three weeks, and for two days had had considerable discomfort in the right pelvis where I found a small tubal mass. As she was preparing to leave for the hospital twelve hours after my examination she had an agonizing pain, and her family physician who happened in at

that time found her in apparent collapse and pulseless at the wrist. After a hypodermic of morphia she soon rallied, and he hurried her to the nearest hospital where I operated in an hour from the time of rupture, and was surprised, in view of her symptoms, to find only a beginning leakage from a thin area in the outer half of the tube.

In a ninth case I thought of the possibility of tubal pregnancy and had her under anesthesia for diagnosis, when the mass in the side suddenly disappeared. This made me rather more suspicious of tubal pregnancy, and a hurried laparotomy showed a freshly ruptured tube and a sac containing a seven weeks' fetus.

The only death in my list was from a condition of intestinal paresis and obstruction. The patient's first "angina" attack had occurred five days previously with agonizing diaphragmatic pain. She had been vomiting for four days when I operated. The greatly distended cecum was left in the wound and opened two hours after operation, but the distention of the small bowels persisted, and she died in forty-eight hours.

With the general practitioner and the surgeon both keenly alive to the possibilities of ectopic pregnancy, there will certainly occur some unnecessary operations. I have subjected one patient to the inconvenience of going to the hospital and having an ether examination, and have operated on four patients for a possible ectopic pregnancy in which operation revealed some other pathologic condition.

CASE I.—Irregular menstrual history, nausea, and salivation, Pain in right pelvis. Mass in right pelvis. Feces. Ether examination.

Mrs. M. E. H., seen in consultation with Dr. Eilau. Three children: oldest three years, youngest six months. Patient began menstruating three and a half months after birth of last baby, and had been more or less irregular in the intervening three months. I saw the patient March 26, 1908. She had had a menstrual period February 1. Early in March she missed her period one week, and began flowing March 9, and flowed regularly until the thirteenth. She then had a chocolate-colored discharge for four days and gave no history of flowing for the week before I saw her. The patient dreaded pregnancy and had nausea and salivation and pain in the right side like a burning sore spot.

On careful examination the uterus was found normal and the left ovary normal. On the right side there was an indefinite boggy mass not thoroughly palpated for fear of rupture. The patient was sent to the Church Home for an ether examination. Before the examination an enema was given and a large quantity of feces was cleared from the lower bowel.

Ether examination then showed a perfectly normal pelvis, the mass in the right side having apparently been fecal in character.

CASE II.—Former operation for ruptured ectopic pregnancy. Spotting between periods. Pain and mass in right pelvis. Ventral hernia. Perisalpingoophoritis.

Mrs. W. operated on eight months previously by Dr. Kelly for ruptured left tubal pregnancy with almost lethal bleeding. It was such a desperate case that Dr. Kelly did as little work as was absolutely necessary and left free drainage.

I saw the patient in consultation with her husband who was a physician. Her menstrual history had been normal until her last two periods when there had been some cramp-like pains in the right pelvis and she had had considerable spotting between the periods.

Examination showed a tender resistant fullness in the region of the right broad ligament. She had a plaque-like erosion of the cervix sufficient to probably answer for the intermenstrual "spotting," and I was much inclined to favor a diagnosis of slight pelvic inflammatory disease rather than tubal pregnancy. She was a stout woman and had an increasing ventral hernia following her drainage operation. This gave us sufficient cause for operating and an opportunity to leave no risks concerning tubal pregnancy. The right tube and ovary were found wrapped in moderate adhesions and adherent to the broad ligament.

CASE III.—Unrecognized abortion. Irregular bleeding for twelve days. Mass in the right pelvis. Salpingitis.

Mrs. M. W., age twenty-eight. Patient of Dr. Mary Cook Willis. Two children, three years and thirteen months.

Patient had been in bed for one week because of a "heavy tired feeling" in the pelvis and some pain like neuralgia. Her periods had been regular, the last one beginning on time twelve days before I saw the patient, and she had had an intermittent bleeding for the twelve days in spite of being in bed for the last week. On examination the uterus was large and boggy feeling; the cervix and uterus suggested a two to three months' pregnancy. On the right side there was a small, rounded, smooth mass back of the broad ligament, and beyond this and adherent to the pelvic wall there was a smaller mass. The first mass next to the broad ligament was considered a tubal pregnancy and the mass above an adherent ovary.

At operation the first mass was found to be a cystic Graafian follicle of pregnancy and the upper mass an enlarged, inflamed, adherent tube. After finishing the abdominal operation the vagina was found to be full of blood-clot, and a curettage of the uterus brought away placental tissue.

CASE IV.—Former operation for ruptured ectopic pregnancy. Missing of menstrual period, spotting, severe pain. Appendicitis.

Mrs. B. H., aged twenty-eight. Seen with Dr. Marshall G. Smith. The patient had been married seven years, and had a miscarriage two years after marriage. Dilatation and curet-

tage by Dr. Seegar some months after this miscarriage, and in May, 1907, one year before I saw the patient, Dr. Seegar had operated for ruptured extrauterine pregnancy on the left side. I saw her June 16, 1908. Her last regular period had been early in May. Missing her period early in June and in a probable attempt at bringing on an abortion, she took a carbolic-water douche, which was so strong that it burned the vagina badly. For two weeks she had a little spotting and feeling as if she would menstruate. Yesterday, June 15, had severe abdominal pain and got very weak and felt just as she did at the time of her ruptured extrauterine one year before. She went to bed at 5 P. M., and was awakened by pain at 2 A. M. She put off calling Dr. Smith until 7.30 A. M. and said she was afraid she would die from pain. Dr. Smith found her pale and with a pulse of 120. He gave her one-fourth grain of morphia by the mouth. When I saw her at 11 A. M. she had good color, but the pulse was 140 and she had long sighing respirations. Palpation showed great abdominal resistance, especially over the appendix region.

I was so certain that this was a case of ectopic pregnancy with leakage that I did not make the pelvic examination until the patient was in the hospital and under ether at 1 P. M. The examination was then negative.

Abdominal operation revealed a deeply congested appendix as the cause of her symptoms.

CASE V.—Former operation in which ovarian cysts were probably removed. Mass in right side diagnosed small ovarian cyst. Irregular menstruation and continued pain. Diagnosis changed to possible tubal pregnancy.

Mrs. J. E., age thirty. Seen with Dr. Julius Friedenwald. The patient had been married ten years and had one child nine years of age. Six years previously, Dr. Noble, of Atlanta, had operated for malposition of the pelvic organs and the husband says that Dr. Noble removed a small tumor from each ovary. These were probably ovarian cysts.

The patient menstruated about every thirty days, having a six- to seven-day flow, and for the past four months she had had a good deal of pain in the right side at each period. The patient first consulted me July 23, 1908, because of this pain in the right side. I found a small cyst in the right ovary. Eleven days later the patient consulted me because of her menstrual period which had come eight days too soon and was still present. I considered the irregular bleeding as due to some disturbance in the cystic ovary. Five days later Dr. Friedenwald had me see the patient again because of an increase of the bleeding. I then considered the possibility of the mass on the right being a tubal pregnancy, and I sent her to the Union Protestant Infirmary for observation. After two days in bed she had ceased bleeding, but I was so concerned about her that Dr. Dobbin was called in consultation. The mass on the right seemed

too near the broad ligament and too thin-walled to be a tubal pregnancy, but Dr. Dobbin felt in view of her history and with his palpation findings that it was probably a case of pregnancy, and we decided to be on the safe side and operate. I found a thin-walled ovarian cyst. Just one year later, or in August, 1909, the patient came to me with almost an identical history to that given the year before, except that the discomfort was on the left side. I found what I considered a simple cyst in the left ovary and sent her to the hospital where under bimanual pressure I ruptured the cyst without serious consequences. In November, 1909, three months later, the patient came again with the irregular bleeding and discomfort in the right side, and I found that another cyst had developed in the right ovary. The patient was advised to await further developments, and she has not had trouble since.

Of the four cases operated on I felt certain of the diagnosis being ectopic pregnancy before ether was given in Cases III and IV, and after ether in one case only, Case III. I felt that in Case II the bleeding was from the eroded cervix and the pelvic signs and symptoms were due to inflammatory disease. I would not have operated for a possible ectopic pregnancy had it not been for the increasing ventral hernia which needed attention. In Case V my diagnosis from the beginning had been ovarian cyst, but on calling a consultant in whom I had great confidence and having him favor ectopic pregnancy as the diagnosis, I felt that the safer course was to be found in operating.

This was the only patient operated on unnecessarily, but even her case had a happy ending for I found and removed a chronic appendix, and a constipated habit of years' duration was at once corrected.

In Case III the curettage alone would probably have sufficed. To summarize my views concerning this important subject, I would say:

1. The surgeon is at fault for having taught that the diagnosis can rarely be made before the tragic stage.
2. The general practitioner or the specialist, in other words, the physician to whom the patient first comes, should make the presumptive diagnosis in the majority of cases by the history alone.
3. The diagnosis having been made of ectopic pregnancy before rupture, operation should follow at the earliest possible moment. After rupture, every effort should be made to keep the patient quiet mentally and physically until conditions can be arranged for a rapid clean operation. If at a distance from a hospital,

she should be operated on at home. If she is to be transported to a hospital sufficient time should elapse to demonstrate that she is not bleeding.

While waiting for a better condition morphia should be used to quiet the patient, physical exertion of any kind should be prohibited, and stimulants and salt solution if used at all should be given with great care to prevent raising blood pressure to a point of renewing the hemorrhage.

4. If the signs and symptoms indicate a possible ectopic pregnancy and there still exists a reasonable doubt, the patient should be placed in a hospital until a more certain diagnosis can be made. It is better to operate on an occasional patient unnecessarily than to lose a patient from hemorrhage.

2305 ST. PAUL STREET.

THE TREATMENT OF ECLAMPSIA.*

BY

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THE Census Bureau states that on June 1, 1910, the estimated population of the United States is 89,599,209. Applying the birth-rate of England and Wales for last year, 25.58 per thousand of the population, as our own figures are unobtainable, there were 1,291,922 labors at term in this country during the last twelve months.

It is generally admitted that eclampsia occurs once in 300 pregnancies. There were, therefore, at least 4,306 cases in the United States last year. The mortality of eclampsia in general practice is about 33 per cent.; consequently, 1,435 of our country women lost their lives last year by this disease.

Those of us who have ample experience in the treatment of eclampsia, and who must keep informed upon the subject, know that the mortality can and ought to be kept below 10 per cent. It appears, therefore, that the lives of more than one thousand women are unnecessarily sacrificed in our country every year. These women, in the majority of cases, are primiparæ, just entering upon wifehood and motherhood.

Mere words and figures convey no adequate idea of the irreparable loss to the family and to the community indicated by

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these statistics. Moreover, this irrefutable statement is a serious arraignment of our profession.

It would seem, therefore, that a national society such as ours could devote itself to no worthier object than an inquiry into the cause of an unnecessarily high mortality of a common disease, and suggestions to the profession at large for improvement in treatment that will insure better results.

What follows must be an expression of individual opinion, which I hope will be supplemented and corrected by the views of our members.

Time will be saved by a succinct statement of the writer's present routine treatment, preventive and curative, of eclampsia.

If the blood pressure is carefully observed and regarded as an invariable index of toxemia in the latter half of pregnancy when over 150, and if pregnancy is interrupted if it is impossible to reduce the blood pressure below 180 by a rigid antitoxemic regimen, eclampsia can almost always be prevented.

In the treatment of the actual convulsions the following scheme can be depended upon to reduce the mortality under 10 per cent.:

Lavage of the colon and stomach removes a possible additional intoxication from the alimentary tract. Purgation is a valuable means of elimination. The stomach-pump is utilized to introduce two ounces of castor oil with a drop or two of croton oil. The purgation is continued by concentrated Epsom salt solution in 2-dram doses if the patient can swallow. Sweating is the most valuable means of elimination. The patient is put in a sweat cabinet for thirty minutes every four hours, in steam heat. Every physician who may see such patients should be provided with a portable sweat cabinet.

Hypodermoclysis.—After the first sweat a quart of salt solution is injected under the breasts.

Subsequently at least a quart of the solution is injected between the sweats in the colon.

Venesection.—If the blood pressure is over 180, sixteen ounces of blood should be withdrawn.

Medication.—Fifteen minims of veratrum viride fluid extract is given hypodermically. Subsequently 1/100 gr. of nitroglycerine is given every four hours. Chloral by the bowel and chloroform by inhalation during the convulsions may be administered, but they are unimportant. Parathyroid extract is of value. One grain is administered every four hours.

Obstetrical Treatment.—If the woman is pregnant or in labor, nothing should be done except to puncture the membrane, which more quickly and decidedly reduces blood pressure than anything else. Any form of accouchement forcé adds to the risk and increases the mortality. After puncture of the membrane and with the active eliminative treatment an easy spontaneous labor is the rule within eight hours.

I am aware that this statement will not pass unchallenged by some of my colleagues, and is not in accord with the views of many specialists in Europe, but it is based on a personal observation of more than two hundred and sixty cases in which both plans have been tried. I find that in reviewing these cases that I can obtain better results by nonintervention than by active interference. In spite, therefore, of some predilection in favor of operative treatment I am compelled to adopt the course that experience teaches me is safest for my patients.

Finally, treatment must be continued for at least a week after the cessation of convulsions. Naturally, the severity is reduced as the patient improves.

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THE DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS OF THE PATHOLOGIC PROCESSES CAUSING ENLARGEMENT OF THE KIDNEY.*

BY

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THE remarks composing this paper are based upon a practice in abdominal surgery covering a period of sixteen years and are merely intended to represent the writer's personal views and those methods that he has found most serviceable in making the diagnosis of renal neoplasms and other lesions causing enlargement of the kidney.

As in every other branch of surgery, affections of the kidney require a complete history of the case in order to arrive at a correct diagnosis. Patients often make mistakes when their opinion is asked about the size and growth of the tumor present, but, generally, they will be able to accurately give the starting-point of the tumor, and very much depends upon this fact.

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In most cases there are disturbances in digestion, and after a certain lapse of time vomiting occurs, and later on emaciation. The patient will also complain of headache and pain in the renal region, which in some instances is not especially marked, but it is continuous and of a rather dragging, dull kind. In other cases the pain occurs only occasionally and is then severe and sharp, radiating toward the thighs. Disturbances in the micturition will be noticed, such as some diminution in amount or, on the other hand, there may be polyuria. Blood or pus may be found in the urine. These symptoms, when combined with a swelling in the abdomen, are usually enough to cause the patient to consult the surgeon.

On inspection, when the tumor has reached a certain size, swelling of the abdomen will be readily seen when the patient lies on the back or side. It may also project into the lumbar region, but one should not conclude from this fact that a renal enlargement exists. Extensive dilatation of the abdominal veins is of little consequence as far as the diagnosis is concerned, because it is met with in many other affections, particularly in hepatic cirrhosis.

Palpation is far more important than inspection, and numerous are the methods that have been advised. Guyon has insisted on renal ballottement. Much may also be obtained by feeling the border of the liver and spleen, but, in point of fact, this is frequently a difficult matter, particularly when adhesions are present. The consistency of the tumor should be noted, and if a grating noise can be elicited, it is suggestive of renal calculi. Palpation of the growth is possible when the patient is not too fat and when the tension of the abdominal walls is not too great. The lower pole of the tumor can often be made out because it does not usually sink behind the iliac crest. Its posterior internal border may sometimes be rendered difficult of detection when a marked physiological lordosis exists. The intestine should always be thoroughly emptied before the examination is undertaken.

Placing the patient on the normal side will sometimes be of service: one examining hand is placed on the anterior abdominal wall, the other over the lumbar region. During respiration the tips of the fingers should be made to glide over the lower pole of the kidney. Although it has been upheld that the kidney does not move with the respiration, I have, in quite a few cases where the organ was enlarged and not adherent, been able to

prove that it does follow the respiration. An enlarged non-adherent kidney will excurse from the beginning of inspiration to the completion of the act, while the liver excurses only at the end of inspiration.

Ballottement is, perhaps, the best diagnostic proof that we have for proving that the tumor really lies on the lumbar region, provided it has not reached such a size that it has become adherent to the anterior abdominal wall. When this has occurred the renal origin of the growth can often be established if the other abdominal viscera can be palpated separately from the growth. The renal origin of the tumor can furthermore be established in many cases by its retroperitoneal position, as is shown by the presence of the ascending or descending colon running over the anterior surface of the tumor, and may be felt there as a narrow, firm band which can be rolled under the fingers when it is empty; should it contain gas it will be detected in the form of a soft, sausage-shaped protrusion. Frequently, however, it cannot be felt, particularly on the right, where, on account of the position of the intestine in relation to the kidney, the former is frequently pushed inward or downward. These statements apply only to tumors which have not reached an excessive development and are of no value in those instances where the growth occupies the entire half of the abdominal cavity.

Confusion with other tumors is quite possible when portions of the intestines are present over the anterior aspect of hepatic or ovarian growths as a result of adhesions. Thus, for example, the small intestine was found lying across the neck of a cystic gall-bladder to which it adhered. In these cases palpation will only be of value when the border of the liver can be distinctly made out from that of the tumor. Then, again, one cannot always exclude the hepatic origin of the growth from the mere fact that the free edge of the liver can be made out, because a neoplasm may arise in the under surface of the liver.

The nature of a renal growth is not always easy to be ascertained by simple palpation. However, it may be said that there are three pathognomonic results, movable kidney being excluded, which, however, are not frequently encountered. These are: 1, Hydatid thrill; 2, a grating sound when several large stones are present in the renal pelvis in thin subjects with flaccid abdominal walls—this is a very rare occurrence, but such cases have been encountered; 3, shrinking of the tumor when pressed upon, in which case one is dealing with a retention cyst which

has discharged a portion of its contents into the bladder. The presence of fluctuation is often very difficult to detect, and even when it can be the nature of the cystic growth cannot always be surmised.

I will particularly insist upon the fact that ballottement may be elicited in certain cystic growths arising from the under surface of the liver and, consequently, this sign must never be considered as absolutely pathognomonic as far as cystic growths of the kidney are concerned. Then, again, any cystic growth of the omentum or spleen may give rise to ballottement, provided that the growth is in contact with the posterior abdominal wall.

A renal growth sinks down to the iliac fossa when it extends as far as the median line, and when not very large it is never in direct contact with the anterior abdominal wall. Under these circumstances it can usually be pushed back into the lumbar fossa with ease. On the other hand, tumors lying under the liver are separated from the latter by a tympanitic zone. They will be found to follow the respiratory movements when the patient is lying on the back and will rise toward the costal margin, and will then show a distinct sulcus behind the anterior abdominal wall and they cannot be reduced into the lumbar fossa.

Generally speaking, palpation of the kidney with the patient lying on his side, when alone resorted to, is not of any great importance, and I feel that it is the most difficult of all methods of palpation and is only of real value when the renal enlargement is still limited in extent.

Attention should also be called to certain cases in which a portion of the kidney is the seat of a cystic or solid growth, and the remainder of the organ retains its shape and rests upon the tumor like a cask. When this condition of affairs can be made out it is valuable from the diagnostic standpoint, because in the case of an abdominal tumor of doubtful nature, it is characteristic of the kidney alone. The relation of the ascending or descending colon to the anterior aspect of the tumor is of diagnostic value only inasmuch as it shows that the growth is retroperitoneal.

Percussion is also of value in the diagnosis of a renal tumor. When the kidney is normal or when the patient is very stout, percussion is of no use, but it is of importance when the kidney is much enlarged. The colon is pushed forward and inwardly, when the growth is large, and is usually flattened out; and if its exact location is to be detected it should first be artificially distended. As a characteristic sign of a renal tumor I believe that the

palpable borders are never the same as those found by percussion. I have never been able to percuss the internal border of a greatly enlarged kidney. The upper border of the right kidney cannot be separated from the liver dullness, but that of the left can occasionally be separated from the splenic dullness, particularly in elderly people. The external border can be mapped out in almost all cases, likewise a distinct space can always be found between the lower pole of the kidney and the iliac crest. If there is much fat and edema in the renal region, enlargement of the liver, or ascites, the result of percussion is rendered unsatisfactory.

Exploratory puncture of a renal tumor in the lumbar region has often been recommended, and in certain affections, such as hydronephrosis, echinococcus cyst, or cystic kidney; it is certainly of advantage upon the condition that operation is immediately carried out, because otherwise there is danger of infection. Puncture, which formerly was considered important for the discovery of malignant growth cells is of little value and probably will fail in most instances.

The fluid removed from a hydronephrosis is usually clear, with a specific gravity of 1,008 to 1,020. Its composition may have undergone considerable change from the secondary processes. For example, it may become cloudy and albuminous from admixture of mucus and pus. Microscopically, uric acid crystals are found. In cystic kidneys there is always polyuria and consequently the specific gravity is much diminished. The fluid may also contain altered red blood-cells and cells containing pigment of a peculiar dark brown hue. Fluid from an echinococcus cyst is usually very clear, of neutral or alkaline reaction, a low specific gravity, rich in sodium chloride which crystalizes on evaporation. Albumin is absent or, if present, only a trace can be found. Succinic acid is said to be a constant constituent.

Referring now to exploratory incision, it is my opinion that when this is done for diagnostic purposes, laparotomy should be resorted to, because it gives a view of the entire abdominal cavity and, what is still more important, the supposedly normal kidney. The operation on the kidney involved should immediately follow the exploratory incision so as not to submit the patient to two interferences.

To sum up the question of physical examination, I would say that inspection, percussion of the lumbar region, as well as an exploratory puncture, are of no particular value when taken alone. The results are of greater value by percussion over the

anterior aspect of the growth, while the most important of all is palpation. The lateral position of the patient is not, to my mind, nearly as good as the dorsal position, but in some cases both may be resorted to with advantage. The cases where exploratory laparotomy is indicated are: 1. those in which the diagnosis of malignant growth is uncertain; 2, in certain cases of anuria; 3. to ascertain the presence and condition of the other kidney, and 4. in severe contusion of the kidney.

The use of the cystoscope and ureter catheter must also be resorted to, as much valuable information may be derived therefrom. The condition of the urine flowing from each ureteral orifice, likewise the manner in which it is projected, are ascertained. The ureteral catheter is of use in detecting obstruction of the ureter and also the presence of a small hydronephrosis, but when the latter lesion has caused a large dilatation of the renal pelvis this mode of investigation will usually be found of no use because some abnormal condition of the ureter has occurred which will prevent the instrument from reaching the kidney pelvis.

Personally I have been well satisfied with the use of Luys' separator in order to obtain the urine from each kidney, and having had a very large experience with this instrument I feel that it may be safely advocated provided that the technic of its employment, as exposed by its originator, be strictly followed.

Considering now the question of renal tumors, it may be said that the diagnosis can be made by palpation, the changes in the urine, and hematuria. The cystoscope will show blood coming from the ureter of the diseased side if the kidney happens to be bleeding at the time. In some cases cloudy urine will be seen coming from the ureter. Catheterism of the ureter will give the same results as the cystoscope, namely, bloody or cloudy urine, in which one may occasionally be fortunate enough to find fragments of the growth. In cases of so-called essential hemorrhage, palpation will remain negative and hematuria is the only symptom present. The cystoscope will show blood coming from the ureter, while catheterism will reveal nothing more. Aneurysm and hematic cysts of the kidney, which are extremely rare, cannot usually be demonstrated by palpation. The cystoscope and ureter catheterism are valueless. Pyonephrosis, whether due to tuberculosis or some other infection, may give rise to enlargement of the kidney, but in these cases the patient is weak, there are fever, pain, and marked changes in the urine.

The diagnosis of hydronephrosis is made by palpation, the changes found in the urine, polyuria, oliguria, anuria etc. The cystoscope and ureteral catheterism will make it evident that no urine flows from one of the ureters. In cases of small hydronephrosis the urine may be drawn by the ureteral catheter, after which the size of the tumor will have diminished. But this only applies to moderate dilatation of the renal pelvis, and in the large hydronephroses there is almost invariably an obstruction of the ureter which cannot be overcome by the catheter.

Large hydronephrotic tumors conceal their evolution behind countless syndromes. They have often been mistaken for ovarian cystoma; their lower pole extending into the small pelvis could easily be felt *per vaginam* in the form of a fluctuating mass on one side of, or behind the uterus, and quite independent of the latter. I am aware of ten instances where this condition occurred.

In another instance the tumor took on the aspect of a hydatid cyst of the liver or of the pancreas, and in one of my cases a calculous hydronephrosis was accompanied by icterus from compression, thus simulating a pancreatic growth.

In these cases this renal lesion has simulated appendicitis, with violent paroxysms of pain, vomiting, and other digestive disturbances. The tumor extended into the right iliac fossa and was mistaken for an appendicular abscess. The operation revealed the true condition and a healthy appendix.

In tuberculous subjects a hydronephrosis is often overlooked and is only found at autopsy. I have met with one such case in which the only symptoms complained of were indefinite renal pain and severe pain on micturition.

A hydronephrosis may also closely simulate renal lithiasis, pregnancy, or a lesion of the pylorus.

There is no diagnostic criterion, but ureteral catheterism is useful and should never be neglected, for often it will affirm the diagnosis and reveal the physiological condition of the other kidney. The areas of dullness and tympany should be mapped out by percussion which will at least indicate the retroperitoneal location of the tumor, and the examination should always be concluded by a careful analysis of the urine from each kidney, when it can be obtained.

As to the urine from a diagnostic standpoint, it may be said that traces of albumin can be demonstrated in almost every renal affection. It is found in nephritis and cystic kidney. Hematuria is encountered in carcinoma and sarcoma. Blood-

pigment crystals, fatty granules, and epithelial elements are also found. It must be said, however, that in some cases of renal tumor, even when far advanced, no changes in the urine can be detected.

The large polycystic kidney is ordinarily bilateral. The kidneys may reach enormous dimensions, even extending as far as the pelvis and may occupy the greater part of the abdominal cavity, and it is in just these cases that a differential diagnosis between ovarian cysts must be made.

A polycystic kidney is composed of a number of cysts of various sizes, the largest being the size of a small apple, while microscopical ones are also present. The contents of the cysts resemble bile and some are brownish-red, this being due to hemorrhage.

In most cases the patient presents the typical symptoms of chronic nephritis, and unless the renal region is palpated no enlargement of the kidney will be evident. In these cases there is polyuria, the urine is of low specific gravity and contains albumen; there is cardiac hypertrophy and anemia. Hematuria occurs, and in this it is distinctive from the small contracted kidney. The urine contains a large number of casts, both granular and hyaline.

Palpation reveals an absolutely characteristic condition of affairs, the kidney being felt much enlarged, hard, and with an irregular surface. This affection is differentiated from malignant renal growths by its very chronic progress which lasts for years, and because it usually involves both kidneys. The simultaneous presence of cysts of the liver which can easily be palpated, helps the diagnosis. Lejars collected sixty-three cases of polycystic kidney, and in eleven instances there were multiple cysts in the liver. It is probable that this affection is congenital and only develops as time goes on.

The differential diagnosis must be made between hydronephrosis, echinococcus, and ovarian tumors. These, contrary to the polycystic kidney, are usually unilateral and fluctuate. The polycystic kidney is very hard and fluctuation can rarely, if ever, be detected.

Renal tumors always have the colon in front of them, while ovarian tumors hardly ever present this condition.

The symptoms of echinococcus cyst are not characteristic in the beginning, and not until the cyst has reached quite good-sized dimensions can a tumor be felt and it is then hard and

can only be made to fluctuate if a portion of the fluid is removed by puncture. Naturally, the most important diagnostic signs are to be sought for in the microscopic and chemical examination of the fluid.

Large hydronephroses develop gradually and slowly displace the ureter. This lesion is probably much more frequent in women than in the male and, therefore, confusion arises in the diagnosis between a renal tumor and ovarian cystoma. Nevertheless, the diagnosis can usually be made. In the first place the location of the tumor, as long as it remains small, is in the lumbar region, and then again one can palpate the lower pole of a large hydronephrosis above the symphysis. And lastly, the position of the uterus will establish the diagnosis. The colon lies in front of the renal growth, whether the latter be large or small, and if the lower pole of the tumor be seized by the hand it can usually be forced up, to a certain extent, into the lumbar region. The hydronephrosis can then be palpated in its anatomical position. If, however, the tumor is adherent or only slightly movable, air may be injected into the rectum, and the course of the colon over the anterior aspect of the tumor can then be made out.

The differential diagnosis between ovarian growths and cystic enlargement of the kidneys can ordinarily be made with ease, but, nevertheless, an erroneous diagnosis can be made, even by those most skilled, and the mistake is not discovered until the abdomen has been opened. Both hard and cystic renal growths may be mistaken for ovarian tumors. Solid tumors of the kidney, whether benign or malignant, may closely simulate a malignant pseudocolloid or cystosarcomatous growth, while various types of ovarian cystomata may assume an appearance very like pyelitis, pyonephrosis, cystic transformation, and echinococcus of the kidney. Although occasionally coils of intestine are found in front of ovarian growths and behind movable renal tumors, this is very exceptional. Large tumors of the right kidney usually have the ascending colon running along their inner aspect. When the gut is found running over the anterior surface of an abdominal growth, this is a signal for a careful examination of the urine. Nevertheless, the urine may be found normal, because the healthy kidney alone is secreting. If there is any doubt as to whether or not the colon can be felt, inflation of the gut should be resorted to and then both percussion and auscultation will immediately settle matters. Ovarian

cystoma and renal cysts may both change in size. When the kidney is the seat of the disease it may discharge its contents into the bladder, while an ovarian cyst can only discharge into the bladder when it is adherent to this organ and has ulcerated into it. Dermoids are more prone to do this than any other type of ovarian growth so that the cystoscope and analysis of the urine will usually clear up the diagnosis. If an exact history of the case can be obtained and one can be assured that the growth was first noticed between the costal border and the iliac crest, it may be assumed that it is renal in origin. If the growth is from the ovary the patient will have first noticed it in the hypochondriac region and then it will have developed upward. Ovarian cysts, when very small with a long pedicle, can alone be mistaken for an enlarged movable kidney. In tumors of the kidney we will get the history of hematuria, renal colic, or considerable difference in the amount and aspect of the urine, while in ovarian tumors, unless there are pressure symptoms on the bladder, nothing will be noted as far as urinary symptoms are concerned. If all these facts are considered, a diagnosis can be made in the majority of cases.

Retroperitoneal lipomata may give rise to some difficulty in the diagnosis, because, as they fluctuate, they may be mistaken for a cystic tumor of the kidney. Symptomatically they only cause discomfort. Cysts of the pancreas and spleen must also be recalled, but generally their diagnosis will not be difficult.

If a cystic tumor has been discovered, the age and history of the patient will usually allow one to exclude the diagnosis of a malignant growth, likewise a pus-kidney, when there is no elevation of the temperature and no bladder symptoms, but echinococcus and hydronephrosis may be a matter of considerable diagnostic difficulty. I would repeat again that no fluctuation can be elicited in the polycystic kidney.

We now come to the consideration of malignant renal growths. Sarcomata are more frequently encountered in childhood; they are large mixed neoplasms (adenosarcoma, rhabdosarcoma), they break through their capsule at a late date in the process, but before this takes place they frequently set up inflammatory adhesions. Carcinomata are felt as large growths, break through the capsule at an early date, and when seen are usually immovable. Otherwise, the symptoms between the two types of neoplasm are the same. Sarcoma of the kidney may occur at any age, but it is most frequently met with between the first and fifth

years of life and after fifty years of age. It grows quite rapidly, its surface is rather irregular, and in consistency it may be either soft or hard. The colon and duodenum are often involved in the process and the result of this is dilatation of the stomach. Edema of the lower limbs occurs as a result of compression of the inferior vena cava. When they have reached a considerable size the diaphragm is pushed up so that dyspnea results.

A very important symptom, when present, is a left-sided varicocele; this has not infrequently been met with in adults, but it must be very rare in children, as I can only find it recorded in two cases, once by Czerny and once by Bastianelli.

The diagnosis of a malignant renal neoplasm can be made with relative ease if hematuria and a tumor are both present. If palpation reveals an enlargement of the kidney which is not very painful, one has very good reason to suspect the nature of the growth. By exclusion and the use of the cystoscope one will be able to eliminate papilloma or epithelioma of the bladder. Renal lithiasis gives rise to severe spontaneous pain, likewise pain on palpation, while the kidney is not increased in size unless a uro-nephrosis has taken place from obstruction of the ureter by a calculus.

In malignant disease the migration of vermiform clots can cause pain, but it is nothing like that resulting from the passage of a calculus. In calculosis there is nearly always a certain amount of pyelonephritis, so that the urine is cloudy, while in renal cancer the urine becomes clear after the bleeding has ceased.

Papillomata or epitheliomata of the renal pelvis also bleed, and the kidney may be increased in size, but only intermittently when the ureter becomes clogged by blood-clot.

A large kidney which does not vary in size, or only slightly so, is generally the seat of malignant change, and any sudden increase in size is due to a hemorrhage into the tumor substance or renal pelvis. This bleeding may so exactly simulate renal colic that this fact should always be recalled.

The hemorrhagic type of renal tuberculosis is characterized by hematuria, and in some cases the writer has seen it reach such intensity that it completely overshadowed all other symptoms, so that malignant disease of the kidney or a hematuric nephritis was suspected, but the kidney was not sufficiently enlarged to be palpated, so that malignant growth could be eliminated.

A very rare form of renal tuberculosis is the so-called neoplastic type, where a tumor in one of the lumbar regions is the first

symptom attracting attention, the true nature of which is often most difficult to determine.

The principal symptoms of malignant disease of the kidney are pain in the hypochondrium of a drawing nature, and when the tumor becomes large there is a feeling of pressure and intra-abdominal distention. The growth frequently develops rapidly, is usually rounded and of soft consistence, and often it is bound down by adhesions. Hematuria does not always take place, but it will be encountered at some time, usually toward the terminal period of affection. When it does occur it is of intermittent type, and may or may not be accompanied by pain. When the kidney is not bleeding, the analysis of the urine is negative. Other symptoms arise, which are due to the presence of adhesions. When the disease has advanced there is loss of appetite, vomiting, local edema, and cachexia. Nevertheless, there are some cases where the progress of the affection is unattended by any symptoms.

The clinical picture may be divided into two symptomatic groups, which, when they occur together, make the diagnosis easy, but in the beginning of the process they are not always easy to interpret. These two groups represent the functional disturbances and the physical signs. To the former belong hematuria, pain, and cachexia; the latter are dependent upon the growth of the tumor. In the adult, hematuria occurs in more than one-half of the cases of sarcoma, while in carcinoma it is present in 75 per cent., and of these it occurs in 25 per cent. as the initial symptom. The character of the hemorrhage indicates a renal neoplasm, when it occurs repeatedly, without any history of trauma, and is continuous for some time in fairly large amounts.

Local pain is very rarely absent throughout the entire course of the disease, but in children it is very apt to be wanting, in spite of the frequently very rapid development of the tumor. As an early symptom of the disease in the adult it occurs in about 28 per cent., while in children in only about 7 per cent. (Chevalier).

Loss of weight and cachexia, as the only early symptoms of the disease are, according to Chevalier, noted in the adult in 18 per cent. and in children, 19 per cent. The most constant sign of malignant growth is tumor which is absent in only a very small number of cases.

For diagnostic purposes, malignant renal growths may be divided into three groups. To the first belong those cases in

which by palpation a growth has been found with the absence of every other symptom. If only a tumor can be found, errors are frequently committed as to its mobility and size, in the former for the reason that the viscera which are adherent to the tumor are very movable, and for the latter, because the development of malignant renal growths generally occurs in an upward direction into the subdiaphragmatic space where it is difficult to palpate them. The reason for this is that frequently the growth develops in the upper pole of the kidney. This is especially true of the left kidney because there is no large organ on that side and tumors of considerable size may escape recognition, so that a negative result from palpation does not signify that there is no tumor present.

In the second group of tumors we have those cases where the kidney is enlarged and hematuria is also present. It would seem from this that the diagnosis in these cases would be an easy matter, but frequently this condition of affairs simulates nephrolithiasis, and often even with the use of ureteral catheter and the x-ray there is still doubt so that an exploratory incision must be resorted to.

In the third group may be placed those cases where there is hematuria without a palpable tumor. A differentiation between renal hemorrhage and bladder hemorrhage is readily cleared up by the use of the cystoscope. However, it is important to bear in mind that in some cases the involved kidney does not give rise to bleeding and the hemorrhage observed comes from the otherwise normal kidney. Separation of the urine will not always indicate the functional activity of the diseased kidney so that here, again, an exploratory incision is required. However, in this case, it should be made in the lumbar region because laparotomy does not expose the neoplasm.

Some cases of renal neoplasm will have a very rapid course, while there are others of undoubted malignancy which have remained stationary for years; there are those where metastases occur early, while others, in spite of the enormous size of the growth with numerous extensive areas of softening, have remained within the capsule and have given rise to no systemic involvement.

Especially among the renal growths which occur in childhood there are very typical symptoms, an almost imperceptible development of the growth until an increase in the size of the abdomen calls attention to the condition. There sometimes is a

regularly intermittent hematuria, while at others the urine constantly contains blood, emaciation is rapid, and finally severe diarrhea occurs. In other cases quite the contrary condition arises in which hardly any evidence of renal enlargement can be detected, while the symptoms are those of a gastric or intestinal catarrh.

The mobility of the growth also is variable; it may be firmly adherent, while in other cases it can be grasped like an ovarian tumor and be pushed from side to side within the abdomen.

Growths of the right kidney may be mistaken for hepatic tumors, but an enlargement of the liver can be differentiated from renal neoplasms in that the former neither extend high up into the thorax nor do they displace the liver to any considerable degree. Generally, the hand may be inserted between the costal border and the enlarged kidney, a thing which cannot be accomplished when an hepatic growth is present. In a large majority of cases the large intestine lies in front of the enlarged kidney, which is made evident by percussion, while only in exceptional cases, either from adhesions with the gut or malformation or atrophy, will intestine be found lying over the anterior surface of the liver. In cases of hepatic neoplasm there are usually symptoms of biliary retention and all renal symptoms are lacking. A tumor formed by a distended gall-bladder is characterized by its pear-shaped form and may be distinguished from an enlarged kidney by the absence of extensive dullness in the lumbar region and by the presence of hepatic symptoms.

It is a more difficult matter to diagnosticate a renal growth when the latter is adherent to the liver, because the important diagnostic evidence obtained by palpation and percussion, must, of necessity, give a negative result.

The absence of mobility of renal tumors during respiration is by no means a reliable sign, because very large kidney tumors have been observed to follow the respiratory movements in a most evident manner. The intestine may also be wanting in some exceptional cases over the anterior aspect of the renal growth and, consequently, it is evident that there is not a single symptom upon which one may depend, so that in all difficult cases a careful consideration of the symptoms presented, as well as an exact history, will be of very great importance.

The left kidney when enlarged, may be mistaken for an enlarged spleen, and here, also, when there is adhesion between

the two organs the diagnostic difficulties become very great. However, a splenic tumor usually runs parallel with the costal border posteriorly, and an indentation can usually be found, while its borders are rounded. It lies flat directly under the abdominal wall, while the intestine lies behind and below it and the history of the case and blood examination will usually settle the diagnosis. An enlarged left kidney extends downward and anteriorly, is slightly movable, and in most cases is covered by the descending colon or the sigmoid flexure, while percussion will reveal a tympanitic zone between the spleen and the kidney.

A marked distention of the portions of the colon, either on the right or the left, caused by gas or fecal masses, may also at first sight resemble a renal tumor, but careful palpation will alone suffice to diagnose the real condition. The symptoms likewise point to marked disturbances of the intestinal functions, and renal symptoms are lacking.

A psoas abscess frequently occurs in the lumbar region and from here extends into the abdomen and may show an indistinct fluctuation or even none at all. However, a careful examination will reveal the spinal origin of the affection.

Interstitial or subperitoneal tumors of the uterus present no difficulty in diagnosis, but a very greatly enlarged kidney has been mistaken for a pregnant uterus in some few cases.

As a rare lesion I would mention malignant disease of the renal lymph-nodes, and those of the prelumbar region, which, when rapidly increasing in size may simulate malignant disease of the kidney.

When a renal tumor is found it is not always an easy matter to diagnose its true nature; thus, renal calculus, complicated by a suppurating process, causes a considerable enlargement of the kidney. A severe tuberculous pyelonephritis may suddenly develop in an infected kidney causing very considerable enlargement of the gland, and later on cystic changes arise in the cortex of the organ.

In favor of the diagnosis of a renal carcinoma we will have a relatively rapid development, which may be somewhat irregular in its progress, a firm, slightly movable tumor which occasionally may present fluctuation in some spots, painful on pressure, with an uneven and occasionally a nodular surface. Hematuria, as I have said, is a frequent symptom, but when this does not occur microscopic blood can usually be found in the urine. Continued pain in the renal region and a progressive decline of the

general vitality, finally leading to cachexia, completes the clinical picture.

Pyelitis and pyelonephritis often cause enlargement of the kidney very similar to that found in malignant disease of the organ. The microscopic changes in the urine without any evident hematuria, combined with the general symptoms of a pus focus, are sufficient to put one on the right road for a diagnosis.

Hydronephrosis is even, rounded, and smooth in surface, usually distinctly fluctuating, giving rise to slight pain or none at all.

Nephrolithiasis rarely gives rise to enlargement of the kidney unless complicated by a suppurative process, but microscopic blood and pus may always be found in the urine.

Simple cysts of the kidney rarely cause much enlargement, but when they do the symptoms are similar to hydronephrosis. Hydatid cysts of the kidney produce considerable enlargement; fluctuation is not often present, but the thrill peculiar to this disease will usually be found. A positive diagnosis is only possible when, from rupture of one of the sacs, hydatids may be found in the urine.

Hemorrhage into the renal parenchyma, calices, and renal pelvis may cause considerable enlargement. In these cases the history will often explain the cause of the renal enlargement, but the possible causal connection between such hemorrhages and the development of a malignant growth must always be recalled.

871 BEACON STREET.

A METHOD OF ANASTOMOTIC REPAIR OF THE DIVIDED URETER.*

BY

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FORTUNATELY, the accidental division of the female ureter in the course of abdominal operations is comparatively rare. Hence the individual experience of most operators is very limited. Yet we have all known of cases, sufficient to put us constantly on our guard against the unhappy accident, which is only too apt to complicate very dangerously an operation which has already taxed the surgeon's strength and ingenuity and also exhausted almost the last resources of the patient's endurance.

*Read before the American Gynecological Society, at Washington, May 3, 4, 5, 1910.

It would seem that the majority of cases of accidental division of the ureter occur in the lower portions of the organ—not far from its implantation into the bladder. So that, in making repair, it becomes feasible to make an opening into the bladder and insert the upper end of the divided ureter—thereby establishing a new communication between the kidney and the bladder, through a shortened ureter.

Again, the ureter may be divided at a point, and in a manner, which makes the new implantation into the bladder impossible or undesirable. Too much tension may be required in order to bring the two organs in contact, and the result would be either immediately disastrous by failure of repair, or remotely so by adding new difficulties, as manifested by intolerant behavior of the viscus, etc.

But a third class of cases does occur in which the ureter is so injured in its course that the organ is materially shortened, and every centimeter of its length is needed in order to make any sort of anastomosis.

We are all familiar with the beautiful uretero-ureteral anastomosis devised by Van Hook, of Chicago, in which the upper portion or end of the divided ureter is inserted into a slit made in the side of the lower section and there made fast by fine sutures. Dr. Kelly has performed this operation successfully in the human being, and it is likely that others have done so since.

Cases may occur, however, where, as I have said, the six or eight centimeters of the ureter cannot be spared in order to make this particular form of anastomosis. We are then obliged to undertake the difficult task of making an end-to-end uretero-ureterostomy or to bring the proximal end of the ureter out upon the abdominal surface or turn it into the bowel (a very undesirable step) and thus establish a fistula for urinary escape.

It is with the object in view, of making an end-to-end anastomosis more feasible and practicable, that I venture to submit the following method of dealing with such cases as I have last described.

Given a case, therefore, which presents a ureter so shortened by the destructive division of its tissue that the simpler implantation into the bladder cannot be done satisfactorily, and in which the lateral uretero-ureterostomy may be considered doubtful, but in which the proximal and distal ends of the wounded tube can be successfully brought into contact, I propose the following steps:

Trimming carefully and clearly at a right angle to the course of the ureter its wounded ends by means of scissors, lifting the upper and lower ends sufficiently from their subperitoneal bed to make manipulation easy, a flexible ureteral catheter with properly finished openings at each end is passed gently down through the lower section of the ureter and into the bladder. There it is met by a suitable metal tube introduced through the urethra—such as a very small-size Kelly's cystoscope—through which the catheter is conducted through the urethral tract to the outside for drainage. The cystoscope, of course, is immediately slipped out, leaving the ureteral catheter *in situ*.

The upper end of the catheter is now passed into the upper section of the ureter a few centimeters and the two ends of the divided tube carefully approximated by slipping them into apposition over the contained catheter. Fine silk sutures are now carefully introduced through the muscularis in such a manner as to make a firm jointure of the severed vessel. Finally, the peritoneal covering is accurately replaced, shutting in the ureter upon its bed of cellular tissue beneath. The urine is now passing freely through the catheter to a suitable receptacle outside the vulva, and may be left in place for several days, if necessary, while the repair is being accomplished.

In removing the ureteral catheter it might be well to start it from its position, at first, by a slight rotation upon its axis and then gently withdrawing it.

I am sorry to say that I have not so far developed this procedure in ureterostomy as to have tested it in the living subject, but having seen one case and known of others where I believe it would have been a very desirable method, I offer it to the profession, hoping that in some cases where a surgeon is unhappily confronted with such conditions as I have attempted briefly to describe he may find this a practical and safe means of escaping from a very uncomfortable dilemma.

FIBROMYOMA OF THE UTERUS.*

WITH SPECIAL REFERENCE TO ABDOMINAL HYSTERECTOMY.
A REPORT OF ONE HUNDRED AND SIXTY CONSECUTIVE
CASES.

BY

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THESE operations have all been performed in one hospital, and the series includes all of my cases since the records of the institution have been found available for reference until January 1, 1910. The list of cases includes all patients having fibromyomata requiring abdominal section who were admitted into the hospital, the only exception being a small number who were unable to bear anesthesia and who died soon afterward before leaving the hospital.*

In this hospital we have the white and black races in nearly equal numbers. Of the cases reported, seventy were white and ninety black or mulatto. Nearly all of the women under thirty years of age were black; nineteen out of twenty-two, or 85 per cent. The youngest white woman was twenty-four, while the youngest black woman was twenty-one.

Under thirty years	22	
Between thirty and forty years	67	
Between forty and forty-five years	32	} 62
Between forty-five and fifty years	30	
Over fifty years	7	
Not known	2	
<hr/>		
Total	160	

The selection of cases for operation includes all cases where a diagnosis of fibromyoma was made which were treated by the abdominal route, but excludes adenocarcinoma or mistaken diagnoses, if such were made, unless associated with fibro-

* Read before the American Gynecological Society, at Washington, May 3, 4, 5, 1910.

* One patient had a very irregular heart and was tentatively refused operation. She was afterward relieved of her tumor by a colleague.

myomata. All operations for other purposes, such as for pyosalpingitis with hysterectomy in which small fibroids were found in the uterus, are excluded, and the operations reported are restricted to those for abdominal hysterectomy for fibromyomata as the primary object. During the time mentioned, thirteen abdominal myomectomies were performed on women liable to bear children, and are only mentioned to show how seldom we thought the symptoms would be relieved by the minor operation. In every case the myomectomy was decided upon as a conservative measure after the abdomen had been opened, the intention having been to perform a hysterectomy.

In order to show the difference in the age of patients in other countries, we mention the statistics of Sutton, Scharlieb, and Giles.

The age in J. Bland Sutton's cases (see Report of 101 Supravaginal Hysterectomies, bound vol. viii, "Essays on Position of Hysterectomy," in London, 1909) is as follows:

Under thirty years	5 cases
Under forty years	33 cases
Under fifty years	47 cases
Over fifty years	16 cases
<hr/>	
Total	101 cases

Giles had a similar experience to that of Sutton. He reports:*

Patients under 25 years	1
25 to 29 years	3
30 to 34 years	21
35 to 39 years	20

Giles had four patients, while we had twenty-two under thirty years of age.

Giles had twenty-two patients over forty years of age, 14.6 per cent.; Sutton had sixty-three patients over forty years of age, 63 per cent.; Scharlieb had sixty-six patients over forty years of age, 66 per cent.; we had fifty-nine patients over forty years of age, 36.8 per cent.

TECHNIC.

The technic of operation is now a matter of less importance than during the evolution of the present excellent methods.

**Lancet*, Lond., vol. i., Mar. 2, 1907, p. 574.

We long since adopted the idea that hysterectomy was a satisfactory and successful operation only when perfect asepsis was secured about the stump. Nearly all of our morbidity has been due to cervical infection, including necrosis of the stump, or some portion of it, possibly due to many tight sutures. Since the adoption of a technic excluding or minimizing these conditions, we find hysterectomy nearly as free from morbidity as ovariectomy, so far as the removal of the uterus itself is concerned. We used silk in nearly all of our work until 1898, when we had a case of infection which finally recovered after all the sutures had been removed. Then we used the Tuffier angiotribe for a few years until we found catgut equal to every demand upon it, since which time we have had but little serious suture trouble.

METHOD OF OPERATION.

The Trendelenburg (high pelvis) position is always used. The tumor with the uterus is drawn up and the ovarian arteries (infundibulo-ovarian ligaments) are double clamped. Single clamps are placed upon the round ligaments or, if the tumor is small, this ligament may be clamped with those first used. The bladder is now separated from the tumor and uterus and the uterine arteries double clamped (if convenient). This, of course, enables one to draw the tumor out through the incision and to amputate the uterus at the internal os without loss of blood from either tumor or patient. But we may be compelled to proceed in an altogether different manner when malignant, tubercular, or inflammatory changes about the tumor demand it. We, however, do not advise or practise any method of hysterectomy which necessitates much traumatism without definite knowledge of the location and direction of the arteries. The fatalities following myomectomy and bisection of the uterus justify the above statement, for the mortality is, after all, higher than in hysterectomy.

Our practice is to sterilize the upper vagina and uterine canal with iodine before beginning the operation, as we occasionally complete the operation as a total hysterectomy. It is a rule to apply tincture of iodine to the stump before placing the peritoneal flap instead of the stronger carbolic acid or the cautery. In total hysterectomy we avoid the use of gauze packing, but generally place a large rubber tube and drain through the vagina. This is not always necessary, for several

of our patients have gotten along perfectly well without either gauze or rubber-tube drainage. Perfect results depend upon the rigidly careful technic, including the preparation of the parts for operation.

THE PROTECTION OF THE URETER.

By reference to the literature of this subject one finds how easy it is to injure or tie the ureter in hysterectomy. We see a report by Sampson from the Johns Hopkins Hospital that the ureters were injured or tied nineteen times, from 1889 to 1904. (See Sutton.) Sutton has had one such accident. (J. B. Sutton, Rept. of 101 Cases of Hyst.) The patient's life was saved, but she lost her kidney.

Blau reports fifteen injuries to the ureter in Crobak's clinic, in Vienna, January, 1900, to January, 1902 (Blau: *Bereit Geb.* 1902, W. Gyn. Leipz., p. 53):

In total hysterectomy seven times, in total ovariectomy three times.

In one foreign clinic there were twenty-four injuries to ureters, resulting in fistula, in 400 total hysterectomies. Of these all recovered spontaneously save two. (Rogers: *Ann. Surg.*, Phila., 1909, xlix, pp. 560-561.)

We have not met with an accident involving injury to the ureters in hysterectomy. If such an accident occurred, our patients have not signified in any manner the distress which is said to accompany the occlusion. It is generally possible to locate and avoid the ureters, and we should not care to have them catheterized even were it possible without distress to the patient and did not involve loss of time. Our plan is to expose the ureters whenever there is the least doubt of their location, and this we find one of the most satisfactory points of the technic of total hysterectomy.

COMPLICATIONS RENDERING OPERATION DIFFICULT.

Beyond doubt we consider the infectious diseases of the ovaries and Fallopian tubes the most productive of all embarrassing complications. Such infection not only involves the adnexa and the exterior of the tumor, but the intestines also. Thus we may be compelled to perform intestinal anastomosis or excision, which always adds greatly to the dangers of operation. One of our cases died of tubercular disease of the uterine adnexa with mesenteric and intestinal complications.

Strangely enough, Cullingworth in his 100 cases (reported in 1902) (*J. Obst. and Gyn. Br. Emp.*, 1902, i, p. 3) says salpingitis was not once met with (p. 26). Yet we note his reference to "serious peritonitic adhesions." Scharlieb, in her last 100 operations for fibromyomata, found only three cases of salpingitis. Next to the diseases of the adnexa, we have found degenerative changes in the tumor itself the most serious difficulty, but in not over 10 per cent. of the cases.

COMPLICATIONS INVOLVING OTHER ORGANS.

The larger number of women aged forty-five or over, having had menorrhagia and anemia due to fibromyomata, will have accompanying kidney and heart or circulatory changes, but not necessarily caused by the presence of the tumor. It is the rule, not the exception, to find casts with or without albumin in the urine of such patients if at or above the middle period of life. An anemic murmur with the first sound of the heart is, of course, expected, and especially when the hemoglobin is anywhere below 50 per cent. So far as the conditions of the heart and kidneys, above mentioned, are concerned, we are generally guided by the visible effect of such findings upon the patient's health. An irregular heart generally becomes regular under anesthesia. An anemic murmur of the heart or a few casts in the urine do not contraindicate operation. We have no fear of the average heart murmur if the heart does good work. But we have some anxiety regarding those obscure diseases of the heart muscle which as yet are not easily recognized, although no accident has occurred which would alter the results obtained in this series.

OTHER COMPLICATIONS.

It is our practice to examine the gall-bladder for stones, and while we see no relation whatever between fibromyomata and gall-stones, yet stones are occasionally present and cholelithotomy is necessary or desirable. This double operation we have noted in five cases, but have not always examined for stones. In one case the stone was allowed to remain on account of the serious condition of the patient. The patient afterward declared that she had never had pain or other symptoms due to the stone, and declined to have it removed, as it involved another operation.*

* Maclaren (*Tr. Am. Surg. Assn.*, 1909) finds the mortality of this double operation a contraindication, and has advised against it.

The blood changes, such as in anemia and chlorosis, are always to be recognized and preliminary treatment instituted, which often materially adds to the security of operation.*

THE RELATION OF MALIGNANT DISEASE TO FIBROMYOMATA.

If we were guided by our own experiences, we should declare that the association of malignancy and fibromyoma merely an accidental matter. Only twice have we seen cancer of the neck with fibromyomata elsewhere in the uterus. We also have seen five cases of adenocarcinoma in association with these tumors. But we have little confidence in the theory advanced by some writers that women with fibromyomata are very much more liable to have cancer or sarcoma.

Our observations lead us to think 5 per cent. of all tumors diagnosed as fibromyomata *before operation* would prove to be of malignant character. This is altogether different from the standard set by many observers, notably by Olshausen.* We are, however, compelled to recognize the importance of the subject and to carefully weigh the evidence of those having collected a large number of cases. J. Bland Sutton has had two cases of cancer of cervix after hysterectomy ("Essays on Hysterectomy in London") and says Quence has seen a cancer recurrence in the vagina after total hysterectomy for fibromyomata. Piquand (in 1905) says of each 1,000 women with fibroids fifteen will have cancer of the body of the uterus, and of women over fifty 10 per cent. will have this form of cancer.

McDonald (*J. A. M. A.*, Chi., 1909, 952-955) in his very full report of the relation of malignant disease to fibromyoma says: In his report on fibromyomata, there were found thirty-five cases of malignant disease, twenty-six of which were carcinoma and seven of which were sarcoma, two not stated.

Fehling had 8	} = 46 in 1734 cases—2.7 per cent.
Hofmeier had 11	
Winter had 27	

(*Zeits f. Geb. u. Gyn.*, 1909).*

* The practice at the Columbia Hospital is to give normal saline solution freely by rectal infusion, and iron and strychnia by the mouth. Such treatment is very effective and produces an increased hemoglobin percentage.

* Olshausen (quoted by Hirst) says 5 per cent. of all fibroids show malignant changes.

* These figures represent the most careful microscopic examination which could only be done by cutting many sections and subjecting the entire tumor to careful scrutiny.

Jacobs (Brussels) has seen (prior to 1899) two cases of post-operative cancer of the neck of the uterus. (*Bull. Soc. belge gynec. et obst.*, 1899, p. 191.)

Scharlieb, in her second 100 cases, saw two associations of cancer and fibromyomata.* (*Proc. Roy. Soc. Med.*, Lond., 1908, Nov. 14.)

Winter has seen ten squamous cancer cases among 753 fibromyomas, and says sixteen observers have reported one or more such cases. (*Zeits. f. Geb. u. Gyn.*, Stuttg., 1906, 57, lvii. Bd., p. 8.)

Freund found one cancer of the neck in each seventy-two cases, which may be considered an average number.

Haultain, in 120 abdominal hysterectomies for fibromyomata, saw five adenocarcinomas.

Hofmeier observed nine adenocarcinomas and eight cervical (squamous) cancers in 445 cases of fibromyomata.

Fehling saw one adenocarcinoma in 409 cases. Winter saw sixteen adenocarcinomas in 753 cases.

It is also possible that the fibromyoma itself may be invaded. Macnaughton Jones reports one such case (*Brit. Med. Jour.*, No. 2558, 1910) and Munro Kerr another. (*Tr. Obstet. Soc.*, Lond., 1905, vol. xlv, p. 291; pub. 1906.)*

SARCOMA AND FIBROMYOMA.

The question of association of sarcomata and fibromyomata has been discussed everywhere, and we find the same diversity of opinion regarding it now as in former years. Bland Sutton says that cases of so-called sarcomatous degeneration of fibromyomata are doubtless sarcomas from the beginning. (See ref.)

Winter found 3.2 per cent. in 500 fibromyomata, taking the utmost care and making many sections. But he says the removal of fibromyomata is not based on fear of sarcomatous degeneration. (*Zeits. f. Geb. u. Gyn.*, 1906, lvii. Bd., p. 8.)

Kronig (*Monatsch. f. Geb. u. Gynäk.*, Berl., 1901, xiv, p. 354) says in one week two myomata were extirpated, both of which showed by microscopic examination of their interior the beginning of sarcomatous degeneration. This caused him to make frequent use of total extirpation of the myomatous uterus.

Three of our cases had unsuspected sarcomatous degeneration of fibromyomata, or at least had the association. They are now

* Our colleague Dr. Mann, of this Society, was the first to report such a case in 1893. His patient developed cancer in the stump after hysterectomy, which proved fatal in six months.

* Other cases are noted in the literature.

briefly described. The first is Case No. 1 of this series. A large mass was found protruding from the uterus into the vagina. As we proceeded with the operation, its character indicated degenerative changes of a malignant character, which caused us to remove the uterus and adnexa, doing an abdominal panhysterectomy. The microscopic examination proved conclusively the malignant (sarcomatous) nature of the growth. This was as perfectly developed sarcomatous degeneration of a fibroid as one meets in practice, yet we have no proof that it was not a sarcoma at the beginning, as Bland Sutton claims.

A second case was not discovered until its real nature was revealed by microscopic examination. As supravaginal hysterectomy was done with the idea that we had only to deal with a soft fibroid, we were obliged to perform a second operation for the removal of the cervix. The result was a cure without recurrence.

A third case, No. 135 of this series, occurred in an old patient (seventy-five years) who had a large fibroid undergoing "calcareous degeneration." The tumor was removed, but the adjoining bowel and its mesentery proved to be involved in a malignant growth necessitating an anastomosis. The patient succumbed to traumatism and shock in less than five days.

Special report of pathologist (Dr. J. S. Neate, for Major Russell, U. S. A.) of Columbia Hospital, April 15, 1910. (Personal communication).

Tumors examined for the hospital.	374
Uterine fibromyomata.	242
Sarcomas	7
Carcinomata	125
Associated carcinoma and fibroma.	4
Of the so-called sarcomatous degeneration of fibroids.	"2 doubtful, 1 satisfactory."
Adenomatous development in fibroids.	2
Hemorrhagic degeneration of fibroids.	5
Angioma in center of fibroids	1
Purulent invasion of inflammatory fibroids	9
No record of cancer of cervical stump, but two cases recalled.	2

DISAPPEARANCE OF FIBROMYOMATA.

We have not been so fortunate as to observe a disappearance

of a fibromyoma. One or more of our most capable and experienced fellows declare that they have positive knowledge that disappearance does occasionally occur. We believe that a disappearance may occur in one of the following ways:

1. A pedunculated fibroid may become separated from the uterus by axial rotation and finally become attached elsewhere ("migrant" fibromyoma).

2. Microbic infection, red degeneration, or necrobiosis may occur with or without purulent discharge. The submucous variety would be most readily infected, and doubtless these furnish many of the "disappearing" cases.

FIBROMYOMATA AND PREGNANCY.

We, like most gynecologists, believe that the presence of fibromyomata in a uterus generally prevents successful impregnation and favors the expulsion of the result of conception. However, many of these women do conceive, and we fail to see why a uterus with a subperitoneal fibromyoma should not be as capable of impregnation as any other.

Our list shows three patients were pregnant at the time of operation.

The first was absolutely unsuspected, although the patient, a colored woman, was examined by the hospital staff prior to the day of operation. A rapidly growing tumor appeared to necessitate operation, and a three months' fetus found after the immense tumor was removed and divided for inspection. We had no knowledge of red degeneration at that time and did not look for it.

A second case, July 6, 1907 (No. 117), was six months pregnant, and we could not discover a fetal heart at the time of operation, hence a "Porro operation" was done. The patient made a perfect recovery. The tumor and uterus, without the dead child or secundines, weighed 3 1/2 pounds.

The third case (No. 142), March 26, 1908, had formerly had a myomectomy for subperitoneal fibroids. She was married two years after the first operation, and came to second operation about three years later. Pain and rapid growth of the tumor necessitated hysterectomy. A two months' fetus was found amid innumerable small fibroids, which made expansion of the uterus impossible.*

* See Mann, AMER. JOUR. OBST., N. Y., 1907, for excellent résumé of the subject.

The red degeneration of Fairbairn (J. Bland Sutton, *Br. Med. Jour.*, Lond., 1908, vol. i, p. 1471, Red Deg. Fibromyoma; also *Essays on Hysterectomy for Fibroids in London*, 8vo, 1909).

We have seen examples of red degeneration in unimpregnated fibroid uteri, and have once seen a striking case in association with pregnancy in the clinic of another gynecologist which we believe answers every indication of this interesting complication. The patient was pregnant and either did not know the fact or deceived her physician, who advised hysterectomy for a painful and rapidly growing fibromyoma. When the tumor was removed it contained a four months' fetus and at least one fibroid of considerable size, which was soft and necrotic, red in color, and with several ounces of red purulent contents. The degeneration of the fibroid had caused the pain, and although the pregnancy was not suspected, it was doubtless the cause of the changes in the fibroid. The fibroid was an interstitial growth, but projected strongly from the musculature of the uterus, but was not beginning pedunculation.

FIBROMYOMATA AND STERILITY, ABORTION AND MISCARRIAGE.

The question whether more women with fibroids are sterile than without them is quite as difficult to study as whether fibromyomata produce abortion. Likewise difficult is the question of the influence of celibacy or the married state, or the effect of pregnancy upon the growth of these tumors.

A discussion of these subjects is quite without the limit of our report and an assertion of our opinion would be irrelevant, but we, nevertheless, believe that it must indeed be a rare combination of circumstances which would justify or approve of the impregnation of any uterus in which is situated a fibromyoma. Pregnancy having occurred, it is the duty of the physician to decide upon the proper course, and he will be guided by the age and condition of the patient, the period of gestation, and the location and size of the tumor, if it be wise to permit pregnancy to continue.

Nervous and mental complications have been seen occasionally, and our list contains the names of two patients who had previously had melancholia, and subsequent to operation developed delusions. Both of the patients fully recovered as soon as their general health was restored.*

* The experience gained in treating these mental subjects who have fibromyomata will be taken up in a future paper, and will include the results of operations upon certain insane patients at St. Elizabeth Hospital in this city.

MORTALITY WITHOUT OPERATION.

Dr. Charles P. Noble says (Tr. Am. Gyn. Soc., 1887) 30 to 38 per cent. of women with fibroids would have died as a result of their disease without operation. This he contrasts with a mortality of 6 or possibly 4 per cent. Without entering into a lengthy discussion of this part of the subject we find that most observers do not agree that such fatality awaits the possessor of a fibromyoma. Keith thought 10 per cent. about right, and McDonald (*J. Ob. and Gyn. Brit. Emp.*, see ref.) found that autopsies show 8 per cent. of fibromyomata had been an indirect cause of death. Roger Williams gives 1 in 2,000 rate of mortality in unoperated uterine fibroids, which appears to be nearer the correct view.

MEDICAL TREATMENT.

This subject may well be dismissed by one who can find neither excuse nor justification for it, especially when he addresses an audience of eminent surgeons and gynecologists.

Medical, including electrical, treatment, has probably not proven more beneficial than it has hurtful, especially so when we include the results of infection and necrosis due to the punctures made by those using the electric method, and the consequent delay of operation. Fibromyomata are benign in character so far as recurrence, metastases, etc., are concerned. But they are not *innocent* when any form of degeneration occurs, and any treatment, medical or otherwise, involving great delay in operation is, or should be, held responsible for all of the complications known to occur in the life history of these tumors. This is of especial import when the menopause is approaching and when advancing age is known to add materially to the complications which greatly increase the danger to life, and raise the mortality of operation from less than 4 to perhaps 20 or 25 per cent.

TREATMENT PRELIMINARY TO OPERATION.

Preliminary medical treatment should always be conducted in the hospital. Extreme anemia is often materially relieved by the use of rectal infusion of normal salt solution.

The examination of the urine and blood, the checking of hemorrhage, and all that goes with the careful study of these

patients is better done in the hospital than at home. In this way the mind of the patient is prepared for the ordeal of operation and her cooperation secured. There is nothing simpler than an easy supravaginal hysterectomy in a fairly healthy subject, and there are few operations in surgery more difficult or more to be dreaded if the patient is in bad condition.

CONSERVATIVE OPERATIVE TREATMENT.

All operations, such as oophorectomy or salpingo-oophorectomy and ligature of the uterine arteries, have been tried by many of the members of this Society. We have had several years' experience with these methods, and while we frequently obtained benefit or even cure of the symptoms by these operations, still we have long since concluded that such work was a confession of failure. It meant that we operated without definite results, and we could not promise our patients a cure in almost every case. It also was proof that there was fear of our mortality list; that we had not found a safe method of hysterectomy.

OPERATIVE TREATMENT.

Since the days when Bantock taught us the use of the Koeberle *serre-nœud*, and the extraabdominal method of treating the stump (a method which first gave surgeons good reason to believe hysterectomy a justifiable operation), the constant aim of nearly everyone was to drop the pedicle and close the abdomen without drainage. Thus Martin, Zweifel, Freund, Goffe, Baer, Kelly, Byford, and others have added modifications to Schroeder's suggestion, and now we believe there is almost universal adoption of the supravaginal or subtotal method for the vast majority of cases.

Many operators make use of the "total" hysterectomy operation with excellent results, as will appear later, and they use the method when there is doubt about the propriety of leaving the stump, as when some form of degeneration is present or, as some claim (Rechelot, the French school), to secure less danger of infection.

Furthermore, there are some good reasons why the immediate results of operation may not be as happy as when nearly all, or indeed all, of the cervix has been excised. One has only to glance over the claims made for total hysterectomy by its advocates to see a number of strong arguments in its favor.

The author has never had, nor would desire having, better recoveries from operation than from total hysterectomy.

It may be taken for granted that most women will be in better or more nearly normal condition with the least sacrifice of their pelvic organs. Hence the tendency of many surgeons is to leave as much of the endometrium as possible, making a high amputation, and also leaving one or both ovaries.*

OPERATIVE TREATMENT, INCLUDING OOPHORECTOMY.

Doran's investigations regarding the after-treatment and history of women who have had hysterectomy with the loss of one or both ovaries show clearly how necessary these organs are to the welfare of child-bearing women. Indeed, we are confident that a vast majority of gynecologists favor the retention of one or both ovaries whenever possible. The actual temporary results are invariably better, although it may be necessary for us occasionally to operate a second time, some months or years later, for the entire removal of the adnexa. Beyond doubt, changes do occur in the structure of ovaries which are allowed to remain after hysterectomy. Our experience would suggest that cystic degeneration is the form of change most frequently seen. In certain instances we have found an apparent swelling or temporary enlargement of the retained ovary, which later on may become atrophied. Finally, there is but little evidence that hysterectomy or ovariectomy produce either neurotic conditions or neuritis or any of the serious constitutional diseases resulting from defective metabolism, such as thyroidism, etc.

THE MORTALITY OF HYSTERECTOMY.

The mortality from hysterectomy has been greatly diminished and the morbidity wonderfully lessened since the present method has been in vogue. We do not, however, forget that the work of Bantock and Keith will always stand out prominently as the world's record for difficult and dangerous work. Given the same kind of complications as they encountered in the neglected cases given them for operation, and we doubt if the surgery of to-day is more wonderfully successful. As everyone knows, the tendency of physician and surgeon alike is to favor early

* See A. G. Doran, Subtotal Hysterectomy for Fibroids. The after-history of sixty cases. Remarks upon the Abel-Zweifel Theory. *Lancet*, Lond., 1905, vol. i., page 1310. (Abel, *Archiv f. Gynäk.*, vol. lvii., p. 290.)

operation, and that this accounts for our lower death rate is beyond question. Bland Sutton tells us of the diminished mortality from abdominal hysterectomy in London hospitals. (See Ref., *Jour. Obst. and Gyn. Brit. Emp.*, Lond., 1908, xiii, p. 328.)

In 1896, in all London hospitals, forty-nine hysterectomies, eleven deaths, 22.4 per cent. In 1906, in all London hospitals, 348 hysterectomies, eleven deaths, 3.13 per cent.

The results of hysterectomy in the Johns Hopkins Hospital also show a greatly diminished mortality. In a long list of 969 cases, including several years of work, the mortality is reported as 5.98 per cent., while in a later period of two and one-half years prior to January 1, 1909, the mortality in 192 cases was two, or 1.04 per cent. (See Kelly Cullen, *Fibroid Tumors*.)

The results obtained by various operators show the same relative improvement. Thus Noble, who claims 4 per cent. as the average percentage, has secured as low as 1 per cent., and once had a series of eighty-eight consecutive supravaginal hysterectomies without mortality. (Tr. Am. Gyn. Soc., 1907.) McLaurin (Tr. Am. Surg. Assn., 1909, p. 269) has had 100 abdominal hysterectomies with only three deaths.

Baldy, in 250 supravaginal operations, had twenty-one deaths, 8.4 per cent., but later had a consecutive list of 105 supravaginal hysterectomies with only three deaths. (Baldy, *AMER. JOUR. OBST.*, p. 7, 1905, vol. liii, p. 560.)*

Deaver, in 1905, reported 219 operations with twenty deaths, or 9.13 per cent. mortality. In Deaver's last (reported) list of 105 cases, only three died, or 2.85 per cent., while his last (reported) forty-eight cases were all successful.

Webster has had a successful run of 100 cases with three deaths. (*Surg. Gyn. and Obst.*, Chic.)

Werder had 118, with one death, 0.84 per cent.

St. Mary's Hospital, Minn., reports 959 hysterectomies for all purposes (1902-1909). The supravaginal hysterectomies (836 in number) show 2.2 per cent. mortality. The total hysterectomies 4.9 per cent.*

Scharlieb, in her first 100 (prior to 1902), eight deaths; in her second 100, between October 18, 1902, and October 28, 1908 (see Proc. Roy. Med. Soc., Lond., Nov., 1908), two deaths.

* Baldy's panhysterectomies alone, 14, with 7.14 per cent. mortality.

* The exact number of operations for fibromyomata could not be ascertained in time for our report.

J. Bland Sutton has had a recent series of 101 supravaginal hysterectomies with no mortality. (*J. Ob. and Gyn. Br. Emp.*, Lond., 1908, xiii, p. 328.)

Webster calls attention to the high mortality reported in foreign hospitals, reaching all the way from an average of 8 per cent. to the highest 14 per cent. (*Surg. Gyn. and. Obst.*, Chic., 1908, Feb., p. 200.)

A careful examination of these reports shows results in certain quarters which compare favorably with those of English and American surgeons.

Gregoried (St. Petersburg), working in Von Ott's clinic, reports the following:

In 651 conservative cases, 4.4 per cent.

In 176 cases of total extirpation by the abdominal route, 4.9 per cent.

In 105 cases of supravaginal amputation, 11.4 per cent.*

In 1898 Kustner reported forty-eight total hysterectomies with eight mortality, and fifty supravaginal hysterectomies with one mortality. (*Berl. Klinik*, 115 to 126, p. 1.)

Olshausen (*Handbuch der Gynäk.*, ii, 1897) reported: Supravaginal hysterectomies, 5.6 per cent. mortality; total hysterectomies, 9.6 per cent. mortality.

Bumm (*Zur Technik der Myomatomie*, *Zeit. für Geb. u. Gynäk.* Vol. Hegar, I. I, 1898) reported twenty-six total extirpations with one death.

The mortality in any given list may be exceptionally large if the cases are selected because of their obviously poor health and generally bad condition. *Per contra*, if care is taken by dispensary physicians or those having control of the clinical material sent into hospitals, it is quite possible to exclude the very ill patients with many evil results of long-continued bad health. We are convinced that a long list of hundreds of successful hysterectomies may indicate an exclusion of many border-line cases greatly in need of operative treatment, although attended by greater than the average risk to life. Therefore one must consider such reports as that of Cullingworth (see *An Analysis of 100 Cases of Uterine Fibromyomata*, *Jour. Obst. and Gyn. Br. Emp.*, Lond., 1902, i, p. 3) in the light of a pathological investigation rather than an attempt to confine his attention to an operative technic or low mortality. He reports a

* The vaginal hysterectomies in the same clinic (Von Ott's) were 2.3 per cent.

relatively large proportion of cystic, fibrocystic, necrotic, or infected tumors, with a total mortality of 9 per cent.

CYSTITIS AFTER HYSTERECTOMY.

It may be taken for granted that every total hysterectomy will have cystitis as a complication, especially if the catheter must be used. There is a growing disposition to regard every hysterectomy patient as a victim of this disease. The fact is easily demonstrated that nearly all "catheter" cases have cystitis, and it is not an argument against this proposition that the patient makes no complaint or that the urine was apparently normal. Many women have recovered and many more will do so, without precautions or treatment of any kind, yet it is far better to avoid the disease or check it in its incipency. This needs no extended comment. Our rule is to irrigate the bladder and throw in a 2 per cent. solution of protargol twice before the patient leaves the hospital. Definitely favorable results will generally follow this measure of prevention.*

SUMMARY OF COMPLICATIONS.

In no instance has a "ligature slipped" or catgut proved unequal to the demand made upon it for hemostasis. If absorbed too soon, the resulting hemorrhage gave no indication.

The Tuffier angiotribe was completely efficient in the various operations in which it was used; about twenty in number.

Heredity has not figured in our list of cases, but in one white family we had three sisters with large fibromyomata. One of these had an accessory uterine artery.*

SUMMARY OF COMPLICATIONS.

Tubal: Pyosalpingitis salpingitis hydro- 46 = 28.7 per cent.
salpinx

Ovarian: Cystic ovaries 27

Ovarian tumor..... 1 = 16.1 per cent.

Cancer of cervix uteri..... 2 = 1.25 per cent.

Sarcoma 3 = 1.87 per cent.

Necrotic or necrobiotic 6 = 3.75 per cent.

* The administration of urotropin (hexamethylenamin) is made a rule prior to all operations by some surgeons.

* In one private hospital case, not included in this report, a patient had an accessory (left) uterine artery. The vessel was of enormous size and possibly aneurysmic. Only by the most heroic efforts was the patient saved from fatal hemorrhage (referred to me by Dr. Klipstein, of Alexandria, Va.).

Cystic, mucoid, hyaline, or myxoid degenerations	5 = 3.12 per cent.
Associated adenocarcinoma of body*	2 = 1.25 per cent.
Calcareous	5 = 3.12 per cent.
Pregnancy with tumor	3 = 1.87 per cent.
Phlebitis	5
Fatal pulmonary embolism*	1
Cerebral embolism, 48 hours after operation	1 (rec.)
Delirium after operation	2
Diabetic patient	1
Ureters injured	0
Hemorrhage after operation	0
Transfusion in vein necessary to save life on table	3
Deaths from anesthesia	0
Infection under stump requiring dilatation of cervix	3
Pleuritis after operation	2
Pneumonia after ether	0
Time of operation in supravaginal hysterectomy	45 to 60 min.
Time of operation in total hysterectomy	60 to 80 min.
Fatal ileus, after operation associated with other complications (Case No. 43—J.)	1
Secondary operation involving re-opening abdominal incision	0

MORTALITY.

In 1893, 1 death	} 130 supravaginal hysterectomies 30 panhysterectomies — 160 total
In 1897, 2 deaths	
In 1899, 2 deaths	
In 1906, 1 death	
In 1909, 1 death	

Total 7, or 4.37 per cent.

Following the custom of other surgeons; we report our latest results.

The last 114 cases show two deaths, or 1.75 per cent. mortality. (Since June 14, 1899.)

* Adenocarcinoma not included when operation was performed for malignancy.

* Twelfth day.

DEATHS.

CASE No. 3.—Mar. 25, 1893. Fibromyoma filling the abdomen. Patient in good condition. She had formidable adhesions about the tumor due to former salpingitis and associated pelvic peritonitis. Death due to sepsis and peritonitis. At autopsy the other organs were found apparently healthy.

CASE No. 26.—M. Pulmonary embolism. April 17, 1897. Patient formerly in good health but for symptoms due to fibroid. No severe complications. Prognosis good at time of operation. Temperature not quite normal at any time after operation, reaching 101° , but was improving when sudden death occurred on twelfth day upon being allowed to sit up in bed.

CASE No. 27.—F. May 1, 1897. This patient had an immense tumor which gave her the appearance of pregnancy at term. She had for many years refused operation and was in poor health when she finally was driven to the hospital for relief. Her heart and kidneys, however, were in fairly good condition, and the fatal result was chiefly due to the severe traumatism necessary for the completion of the operation. Transfusion was not employed, and the patient continued in shock until death on the third day, the heart refusing to respond to stimulants. The condition of the kidneys or blood-vessels appeared to furnish no adequate explanation for the fatal result. A moderate amount of blood was discharged through the glass drainage-tube which was employed. At the present time we should regard this fatal result due to acute dilatation of the heart.

CASE No. 43.—J. June 3, 1899. This patient had been in poor health for several months and had a tumor filling the pelvis and reaching a little above the umbilicus, weighing $4\frac{1}{2}$ pounds when removed. Before operation her condition indicated a perfectly satisfactory result. The heart, kidneys, and all other organs appeared to be in good condition. We were absolutely unable to find any special indication against operation. There were no difficulties about the technic of operation, and the patient left the table, as we thought, with bright prospects for cure. Up to this time we had not made a routine examination of the gall-bladder and appendix, and much to our surprise we discovered at the postmortem on the fifth day, that a long adherent appendix had caused obstruction of the ascending colon. The autopsy also revealed fatty degeneration of the liver and kidneys, with extensive atheromatous changes in the arteries.

CASE No. 46.—C. June 14, 1899. Like the previous case, this patient, we thought, had no contraindication to operation so far as her general condition was concerned. She had a tumor filling the pelvis and lower abdomen weighing nearly 5 pounds, which contained a sloughing submucous fibroid. The patient died from asthenia due to sepsis. No postmortem.

CASE No. 113.—B. December 15, 1906. Patient aged thirty-nine. Ill three years. The tumor mass filled the lower half of

the abdomen, and was made up of tumor, pus sacs, cheesy material, and degenerated ovaries. The intestines were involved and injured to such an extent as to require extensive repair. The peritoneum was unavoidably soiled with pus. As the patient had born six children, it may be taken for granted that the tumor was not of large size, and the appearances indicated a mixed infection; a recent invasion by the colon bacillus of a former tubercular salpingoophoritis.

CASE No. 137.—W. November 2, 1907, aged seventy-five (an emergency case). The patient had a large tumor nearly filling the abdomen. Her illness had continued so long that she was bed-ridden, and she was a most undesirable subject for operative treatment. The bowel attachments to the tumor were so intimate as to cause nearly complete obstruction. We found extensive degenerative changes in the tumor with all of the indications of sarcoma, besides calcareous changes. The large bowel and mesentery were so much involved in the malignant process as to necessitate anastomosis, as excision of the extensive malignant growth was impossible. No autopsy was allowed and the pathologist made no examination of the intestinal complications. He pronounced the tumor of benign character.

This emergency case adds a little to our percentage of mortality, although the pressing symptoms due to the malignant disease demanded relief by operation whatever the result.

MARCH 28, 1910.

DEAR DOCTOR STONE:—

I have so far been able to find that only 160 of your list of operations have been performed in Columbia Hospital. Of this number 70 operations were on white patients and 90 on colored. The operations were as follows:

		Recoveries	Deaths
Supravaginal hysterectomies.....	130	124	6
Panhysterectomies	30	29	1
Myomectomies (abdominal)	13	12	1
Total	173	165	8
All that I have verified are checked.			

Very sincerely,

H. W. LAWSON, M. D.

Supravaginal hysterectomy	130
Abdominal panhysterectomy	30
Total	160 = 4.37 per cent.

Including myomectomies, total mortality = 4.62.

STONELEIGH COURT.

SPONTANEOUS RUPTURE OF THE UTERUS DUE TO
HYDATIFORM MOLE.*

BY

RALPH WALDO, M. D.,

New York City,

(With one illustration.)

DIFFERENT writers vary widely regarding the frequency of hydatiform mole. Some state that it occurs once in two thousand pregnancies, while others put it at once in ten thousand. This discrepancy is probably due to the fact that it occurs so early in pregnancy that only a few go to maternity hospitals. The fact remains that most physicians who have had a fairly extensive obstetrical practice have seen one or more cases.

It is a cystic degeneration of the villi of the chorion, and occurs in three varieties. In each variety the degeneration begins before the tenth week of pregnancy. In the first it probably starts very early, and involves the villousities that cover the entire ovum, and dissolves the entire embryo and its membranes, and you have the "*mole en masse*." In the second variety the degeneration probably commences at a later date, and the amniotic cavity persists, though the embryo is dissolved, and we have the "hollow mole." In the third variety the degeneration also begins very early, but involves a portion only of the villi, thus allowing development of the fetus, which usually dies. In rare instances a poorly-nourished child is born. This is called the "embryonic mole."

Nothing is known regarding the etiology of hydatiform mole. It frequently undergoes malignant degeneration, and over 40 per cent. of all cases of chorioepithelioma occur in cases of hydatiform mole.

The symptoms are those of early pregnancy, with a very few, but important, additions. In the first two varieties (*mole en masse* and hollow mole) the uterus increases in size much more rapidly than in normal pregnancy. At the end of three months the uterus may be as large as you would expect to find it at the end of the fifth or sixth month. There is pain in the pelvis and back, which at times is acute. Usually at the end of

*Read before the New York Obstetrical Society, May 10, 1910.

from five and never later than ten weeks of gestation the patient begins to "spot." At first the blood is small in amount, and gradually increases as time goes on. Later there may be profuse hemorrhage. Woe to the doctor who, not suspecting the conditions, cures a uterus of this kind. I was told of an instance where a house surgeon curetted a patient with hydatiform mole, and the attending surgeon ended by performing hysterectomy to prevent the patient from bleeding to death. In quite a large percentage of cases with this spotting there are small cystic bodies passed, and in all cases of early pregnancy with slight bleeding or bleeding from an enlarged soft uterus a careful search should be made for them, for, if found, they are pathognomonic of hydatiform mole, and if not found, only a tentative diagnosis can be made.

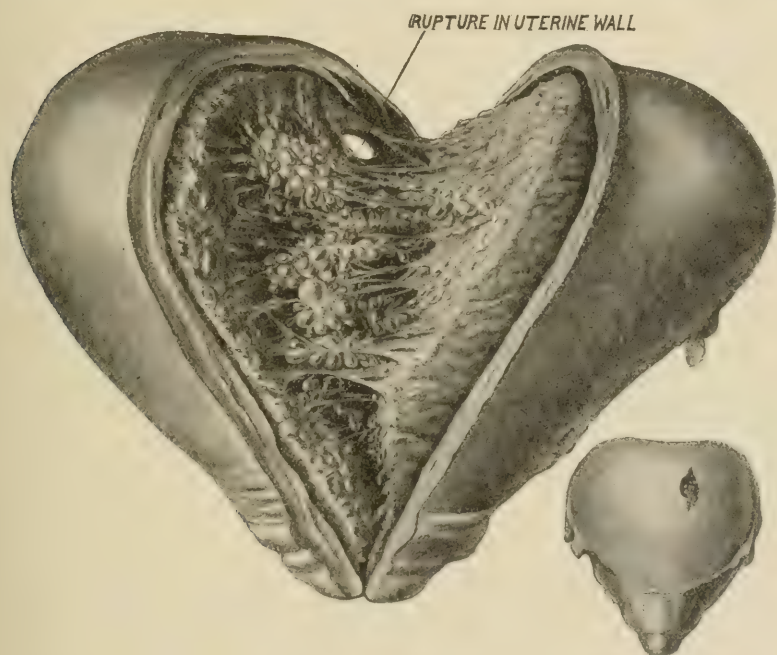
In the first two varieties there is marked thinning of the uterine wall. The following case illustrates a case of "*mole en masse*" that resulted in rupture of the uterus at the end of the fourth month of gestation.

Mrs. G., aged twenty-two years, married one year, no children; one spontaneous abortion at the fourth month, May 3, 1909.

The embryo was seen by Dr. S. Kahn. She menstruated regularly in June and July, and ceased. Considering herself pregnant, her family physician was consulted. He examined the urine and found it normal. There were nausea and some vomiting; mammae enlarged and contained milk. September 4, 1909 (about eight weeks after the last flow), she began to "spot." There was no pain or marked flow of blood from the vagina. Dr. Kahn made a thorough examination, and found an enlarged uterus with the cervix closed. He thought possibly she might have a hydatiform mole and had everything that passed from the vagina thoroughly examined, but was unable to find anything from which a positive diagnosis could be made. October 30, forty-eight ounces of urine were passed. It was given an ordinary examination and pronounced normal.

November 1, 1909, at about 8 o'clock in the morning, while in the toilet she was taken with severe abdominal pain and fainted. Her doctor saw her in a very short time, and I saw her in consultation about two hours later. She was in collapse. The fundus uteri extended as high as the umbilicus. By vaginal examination an exquisitely tender tumor was felt behind the uterus. Abdomen was slightly distended, especially in the lower portion, pulse 150 and very weak, face markedly blanched, breath shallow,

and she complained of severe abdominal pain. In ten hours it was possible to obtain only three ounces of urine by catheter; it was high-colored and loaded with albumin. During this time no urine was passed voluntarily. Temperature was 99° F. She was believed to have a ruptured ectopic pregnancy and was given hot salines by the rectum, glonoin, strychnial sulphate, and a small amount of morphine hypodermically. The foot of the bed was elevated. During the following three days the temperature ranged between 99° F. and 101° F.; pulse gradually improved until the time of her operation, when it was good in



character and 100. Her face very much improved in color, and she felt comfortable. It was not necessary to use morphine after the first forty-eight hours; urine became normal in quantity and quality.

November 5.—At the patient's residence, with the assistance of Drs. S. Kahn, Edward Schnaper, and Harry Aranow, I opened the abdomen by median incision. It was found to contain a large amount of free blood and a few clots. The ovaries were several times their normal size and full of large cysts. The uterus extended as high as the umbilicus and was as large as you

would expect to find it at the sixth month of pregnancy. On the anterior wall of the fundus, slightly to the left of the median line and an inch and a half below the upper extremity of the uterus, there was an irregular perforation three-fourths of an inch in its longest diameter and a quarter of an inch in its shortest. A piece of omentum adhered to this perforation and closed it. This probably saved the patient's life. The omentum was detached, and small cystic bodies were found protruding from the perforation, the edges of which were very thin.

Panhysterectomy was performed, the tubes and ovaries being removed as well as the uterus. A small iodoform drain was placed in the vagina. The broad ligaments and 75 per cent. of the upper end of the vagina were stitched over with catgut. The abdominal wound was closed by the ordinary method. Patient was put to bed in good condition. Convalescence was uneventful. Drain was removed from the vagina on the fifth day. There was primary union in the abdominal wound, and the patient got out of bed on the eighteenth day.

On examining the specimen, the uterus is about twice as large as it should be at the end of the third month of pregnancy. On the anterior wall there is an irregular perforation from which several small cystic bodies are protruding. On incision the cavity is found markedly distended, with a mass composed of a large number of cysts of varying size bound together by a delicate network of friable tissue. In places there is a small amount of blood between this mass and the uterine wall which is thinned throughout, but is very markedly so in the neighborhood of the perforation on the anterior wall of the uterus.

Dr. L. P. Bernstein, pathologist to Lebanon Hospital, submits the following report: "I have made five sections of uterus, and cannot substantiate the diagnosis of chorioepithelioma. All that the sections show is an hydatid mole."

May 10, 1910.—The patient has gained weight and is in perfect health to-day.

Literature contains the reports of a number of cases of rupture of the uterus the seat of chorioepithelioma, but I am able to find only the following cases of rupture of the uterus due to simple hydatiform mole, and all of these died.

L. Seitz, in *Handbook of Obstetrics*, 1904, page 1064.

Lord, in *Edin. Med. Journal*, Jan., 1868. Mole in a sack in left uterine horn. Five days after rupture died of peritonitis and hemorrhage.

Krieger, in *Berliner Beiträge z. Geburtshülfe und Gynäkologie*, 1872, , page 10. Mole on thickened anterior wall of the uterus absorbed the muscularis so that it was only covered by a layer of peritoneum. Patient developed a septic peritonitis.

Wilton, in *Lancet*, 1840, vol. xxxvii, p. 691. Villi broke through the posterior wall near fundus. Died of intraperitoneal hemorrhage.

A. Charpentier states that Madame Boivin reported a case where a woman died from rupture of the uterus due to hydatid mole.

54 WEST SEVENTY-FIRST STREET.

DEFORMITY OF BOTH HANDS OCCURRING IN A CHILD DELIVERED FROM A MOTHER WITH OLIGO- HYDRAMNIOS.*

WITH BRIEF NOTES OF THREE OTHER CASES OF BIRTH PRESS-
URE FROM THE SAME CAUSE.

BY

WILLIAM HUGHES WELLS, M.D.,

Assistant in Obstetrics in the Jefferson Medical College of Philadelphia,
Philadelphia, Pa.

(With one illustration.)

THE history of this case is as follows:

The patient, S. D., aged twenty-one years, went into labor on March 5, 1910. Her calculated date was March 15. Her pelvic measurements were as follows:

A. S. S.	27
C. R.	27.5
T. R.	32.5
E. C.	20.5
R. D.	23
L. D.	22
The anterior ischial	11
Sacrosubpubic diameter	11.5 cm.
-2 = 9.5 cm. for the true conjugate.	

During her pregnancy she suffered from constipation with some toxemic symptoms and headaches.

Saw her first at 10 o'clock on the morning of March 5, at which time there was no dilation in the cervix. By 12 o'clock midnight, same day, the head engaged, fitting tightly. The

* Read at a meeting of the Clinical Society of the Jefferson Medical College, May 9, 1910.

head came down the biparietal in relation to the conjugate and the long diameters of the head in the transverse diameter of the pelvis. There was considerable overlapping of the parietal bones. There was absolutely no attempt at formation of bag of waters.

Previous to engagement of the head, considering the small conjugate, I thought seriously of recommending the Cesarean operation. However, I may state that this was afterward positively refused by the husband, who told me that under no circumstances whatever would he have consented to this operation being done.

After finding that the head engaged I put the patient under ether anesthesia, rotated the head sufficiently to apply the Simpson forceps with axis traction tapes and at 3.30 A. M. on

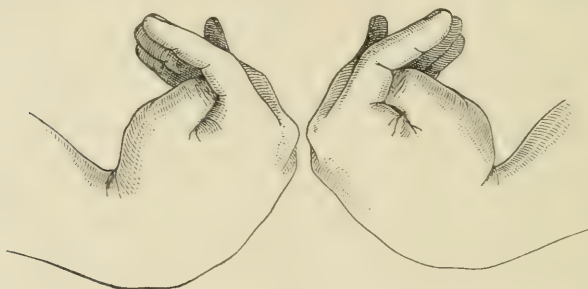


FIG. 1.—Deformity of both wrists and hands in an infant born from a mother with oligohydramnios.

the morning of March 6, delivered a male child weighing about 7 pounds. The delivery of the head was moderately difficult.

There was a bruise over the left eye and a small discoloration on the right side of the occipital bone, undoubtedly produced by the forceps pressure.

Upon birth it was found that both hands had the deformity shown in the accompanying picture. The fingers of both hands were stiff and although the fingers and thumb could be straightened out, they always returned to their original position. There was free movements of the limbs, free flexion of the arms, free motion of the shoulder-joints of both arms.

The amount of amniotic liquid did not exceed one-half ounce and there was absolutely no history of any premature rupture of the membranes. There was a slight laceration of the perineum which was closed with silkworm-gut sutures. The patient made an uninterrupted recovery. The chart was unfortunately destroyed by the nurse.

The child never regained the use of its fingers. The deformity was exactly similar in both hands. I would say here that no effort was made at extraction of the shoulders by pressure in the axilla so that if injury to the brachial plexus of both sides was present it must have occurred through birth pressure. The child was a rather badly nourished little creature and died on the thirteenth day apparently of pulmonary collapse.

The deformity of the hands was interesting from the fact of their exact similarity, and it seems to me possible that this may not have been due altogether to pressure during birth but from intrauterine pressure during pregnancy from the almost entire lack of amniotic fluid.

The second case was a primipara, delivered April 27, 1908. The calculated date was May 6. The pelvic measurements were:

A. S. S.	27
C. R.	27.5
R. D.	21.5
L. D.	21
T. R.	32
E. C.	19.5

The child presented in the posterior deviation of the second position of the breech. In other words, right sacroposterior. The legs were extended on the thighs so that the toes came in front of the face. Labor in this case lasted about nine hours, at the end of which time, the patient becoming exhausted from futile attempts to bring the breech to the pelvic floor on account of extension of the legs, interference became necessary. There was great deficiency of amniotic liquid, there being probably not over 4 ounces

The feet and legs were brought down in the usual way and the back gently rotated so that the latter would come anteriorly, thus bringing the bisacromial diameter into the transverse. In other words, a breech anterior was substituted gradually for a breech posterior. In this manipulation the arms went up above the head and it was necessary to bring them down. This was done in the usual manner, by passing my hand over the child's shoulder, sweeping the arms down over the chest. Considerable birth pressure was exercised on the shoulders.

After birth it was seen that the flexor muscles of the right arm were paralyzed. This arm recovered in about six weeks by the use of suitable electricity and massage.

The third case was delivered January 2, 1907. The patient was a primipara, well-developed. The first pregnancy ended in miscarriage at three months, a year and a half previously. Labor occurred about the calculated date. The pelvic measurements were as follows:

A. S. S.....	26
C. R.....	28.5
T. R.....	32
E. C.....	20.5
R. D.....	22 +
L. D.....	22

The patient started in labor on the night of December 31. The child presented second position of the vertex. Amniotic liquid did not exceed four ounces. The child passed the pelvic inlet in good condition. There was very slow dilation of the cervix due to absence of the bag of waters. This part of the labor occupied a number of hours. There was extreme birth pressure exercised on the head by the most resistant vagina and pelvic floor so that the parietals overlapped for nearly $1/4$ inch. Seeing how severe the birth pressure was, and knowing that the patient had good pelvic measurements, I advised the use of the forceps after the head had passed the pelvic inlet. The patient stated that she did not want the forceps used, as she had passed a perfectly normal pregnancy and wanted to have a normal delivery. The child was born about 3 o'clock on the morning of January 2, dead. The heart sounds ceased about an hour previous to birth. Although no postmortem was permitted, I believe that in this case death was caused by the tremendous pressure of the soft parts upon the head.

The fourth case was a primipara. Pelvic measurements as follows.

A. S. S.....	28
C. R.....	29
T. R.....	32
E. C.....	21
R. D.....	22
L. D.....	22

In this case the amount of amniotic liquid was probably about 4 ounces.

Labor began on the evening of September 18, 1907. The child was born about 6 o'clock on the morning of September 19. Severe birth pressure was exercised by the soft parts on the child which was alive up to within a short time of birth. The child was a male, weighing about $7\frac{1}{2}$ pounds. Death was due to asphyxia from pressure on the cord which apparently had been squeezed against some portion of the pelvic inlet as it was considerably flattened out about the central portion.

Oligohydramnios is a rare condition, said to occur about once in a thousand cases. In the first two cases here reported I do not contend that the lack of amniotic liquid was the cause of the deformity, although it is possible that it may have produced, from pressure of the shoulders against the uterine wall, the deformity which existed in the first case.

In the second case the paralysis of the flexor muscles of the arm was, in all probability, due to the manipulations which were necessary because of the lack of the normal hydrostatic bag which the bag of waters forms in a normal labor.

In the last two cases no interference of any sort was used. I believe that the life of the third child could have been saved by the prompt application of forceps as soon as the head entered the pelvic brim. The lack of amniotic liquid seriously complicates labor as everyone knows and believes. It is reported to be the cause of certain deformities of the fetus and of occasional ulceration of various parts of the child's body, but it seems to me that its worst phase is the manipulation rendered necessary by the absence of a bag of waters, with its wonderful dilating power and the aid which it gives to the entrance of the presenting part of the child into the mother's pelvis.

1135 SPRUCE STREET.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of May 10, 1910, at Mount Sinai Hospital.

The President, R. L. DICKINSON, M.D., in the Chair.

On this evening the Society visited its second hospital in a season. Instead of set speeches there was talk; instead of monologue, multilogue; instead of hearing about things, they were seen. The visitor who thought his own equipment fairly complete found he lacked a room assigned to cystoscopy alone. Operators had a chance to see how much one man in an arena could hide and to learn how little any man on the benches could hear. All opened their eyes at the quiet statements of the head

of the laboratory staff of no less than seventeen workers for one institution of two hundred beds, and none but hoped for times when other hospitals could give to private patients, entering from another street, their separate building, and equipment, and resident staff. Drs. King and Brettauer and their assistants, Drs. Vineberg, Brickner, and Frank, hosts and members of the Society, conducted thirty visitors through operating-rooms and wards. A label over each door showed the purpose of the quarters; just as at the Woman's Hospital meeting the materials used in operations and dressings were clearly tagged. One learned that the way to carry on such clinical meeting was by plan and program and courier, not by haphazard straggling among unplacarded apartments and equipments.

Thereafter, in the chapel, an informal discussion followed the general order of a set of practical questions that had come to the Executive Committee and been printed on the program. The Society had opportunity later to see and appreciate the work of the laboratory and of a German cuisine.

Dr. RALPH WALDO presented a specimen,

SPONTANEOUS RUPTURE OF THE UTERUS DUE TO HYDATIFORM MOLE.*

Dr. BRETTAUER presented a case and exhibited a patient with

FRACTURE OF SYMPHYSIS PUBIS.

The patient was admitted to Mt. Sinai Hospital on March 15, 1910, after having been seen in consultation three days previous. The following history was ascertained:

She is twenty years of age, has been married one year. Has menstruated regularly since her thirteenth year, normal type. Last period was the beginning of June, 1909. Labor began at term, on March 8; the membranes had ruptured twenty-four hours previously. On March 7, she bled freely the entire day, having only weak, intermittent pains. On the afternoon of March 8, according to the report of the physician in charge of the patient, the head had been on the perineum for over two hours and, the pains being insufficient, forceps were applied. No anesthesia was given. The patient was lengthwise in bed, and the child was easily delivered within five minutes without the application of special traction force. The child was slightly asphyxiated, but revived readily, and is as present perfectly well. There were some pressure marks behind the left mastoid process and a hematoma on the right side of the forehead; this later became infected and had to be incised.

A few hours after delivery the patient had a severe hemorrhage and the uterus was packed. Three days postpartum, after a severe chill, the packing was removed. The discharge was foul but moderate in amount.

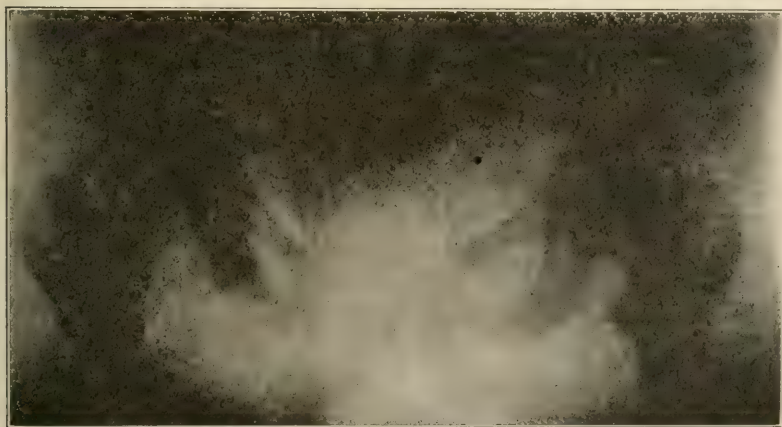
When I first saw the patient, I found her slightly delirious, temperature 104°, pulse 130; she was lying with legs widely

*See original article, page 459.

separated, with slight outward rotation. Active movement of the legs was impossible and attempts at passive motion were extremely painful.

The entire vulvar and anal region were edematous to an enormous degree, making a thorough examination or local inspection impossible. On percussion, the bladder was found to be distended to its maximum; the uterus was not palpable through the abdomen. A moderate degree of meteorism was present. The patient was with difficulty transferred to the hospital where the true condition was discovered.

The introitus was one raw surface, covered with a greenish-yellow membrane. A tear in the anterior right sulcus reached to the clitoris, leading upward into a cavity filled with blood and foul fluid. In this cavity were the fractured ends of the pubic bones; between the bones was a soft nodular mass of pro-



Fracture of the Symphysis Pubis. (Brettauer.)

lapsed tissue (urethra and bladder). The tear extended three-quarter way to the cervix in the right anterior vaginal wall.

Her general condition was good, temperature 103° , pulse 108. The pelvis was strapped with zinc oxide plaster, and a belt reaching from the umbilicus to half-way down the thigh was applied. The cavity was irrigated daily.

With strapping, there was 1 inch diastasis, shown by the x-ray.

She ran an irregular temperature of 100° to 103° plus for one week; then lower, averaging 100° ; the pulse went down to 90. She required catheterization for one week; there was no blood in the urine.

Whenever the strapping was tightened, the temperature rose for one or two days, because of retention. The edema disappeared in a week. The x-ray showed a fracture of the left descending ramus of the pubic bone and also a fracture of the symphysis to the right of the synchondrosis, with separation of 2 inches.

The cavity has slowly contracted and the bones are now covered with granulation tissue.

On April 15, the uterus was well involuted. A cystitis developed, but cleared with irrigations. In spite of straps and belt, a diastasis of 1 inch persists. No evidence of fibrous union can be noted, and the vaginal epithelium appears to be covering the granulation tissue, forming the walls of the sinus.

The patient was permitted to walk seven and one-half weeks postpartum. As you see, she walks without difficulty, but with a distinct, "waddle."

Considering the history of the delivery given by the doctor and repeated several times without variation, *i.e.*, easy extraction of a child weighing not more than six pounds, with the head on the pelvic floor in L. O. A. position, this fracture must be attributed to some other cause than mere force applied in the wrong direction. Exactly what these conditions are, I am not prepared to state as yet, but expect to come to some conclusion at a later date, when I will bring this subject again before this Society.

DR. BRETTAUER presented a

FRAGMENT OF CATHETER REMOVED FROM THE BLADDER.

A woman had attempted to commit abortion, and passed the catheter into the bladder, supposing she was inserting it into the uterus. She is still pregnant.

DR. STUDDIFORD.—I had one similar case. The catheter was a little bit larger. The case came into Bellevue about a year ago, and we found the catheter had gone into the urethra in the same manner as in this.

DR. CRAGIN.—As we examine the patient to-night there is a small sinus on the right side of the vulva nearly healed. Near the middle line, a little to the left, the finger passes into a cavity from the separation of the pubic bones. This has not healed yet. You can pass your finger easily, but the interesting and practical point is that the woman walks very well in spite of the wide separation of the fracture and in spite of the fact that there is still a discharging wound.

Of course the question comes up as to the etiology of this fracture. It would seem as though it was a spontaneous fracture rather than separation caused by the forceps, as I can hardly see if the head had been inside when the forceps were applied how the doctor could have fractured the pelvis.

DR. KRUG gave the following:

OUTLINE OF THE METHODS PURSUED AT MOUNT SINAI HOSPITAL
IN ADMITTING CASES, THE ASSIGNMENT OF THE MEDICAL
AND SURGICAL SERVICES, ETC.

The gynecological service in this hospital is divided into two divisions involving two continuous services, with two attendants, two adjuncts and two assistant adjuncts. Each division has its own surgical staff consisting of the house surgeon, the senior and junior assistant surgeons, and two senior and junior internes.

Of course this staff does not belong to the gynecological service exclusively, but it takes charge of the general surgical services which are also divided into two continuous divisions, besides the special services, eye and ear, genitourinary, and so on.

The patients are admitted through the admitting service either on recommendation from anyone, by applying directly to the hospital, or by being sent by one of the attending or outside physicians or the dispensary. After having been admitted to the gynecological service they are put into the reception ward. In this ward they are stripped, given a warm bath, in a good many cases larkspur is applied freely to the hair and scalp, the pubes shaved and the clothes checked, and afterward they are transferred to the ward.

The idea of the reception ward is to detect, in the first place, any communicable disease. They come in filthy and dirty from the outside world, and we observe them sufficiently long to know if they have an acute contagious disease.

It is done in such a way that patients sent by anyone attending to one division are admitted to that division, otherwise we try to follow out the routine practice of dividing the major and minor cases equally between the two services.

Each gynecological service has two regular operating days. The rules of the hospital ask for operations in the afternoons only so as not to interfere with the service in the wards.

DR. DICKINSON.—Is there an admitting officer?

DR. KRUG.—Yes. A chief officer who is appointed by the board of directors and some assistants. He is a medical man and paid a salary. The board of directors is willing to pay a salary, although the present incumbent declines to accept any. The assistant physicians on the visiting staff also visit the patients in their homes and see whether their cases are suitable for the hospital.

DR. GOFFE.—Does the visiting surgeon examine his patient before she is admitted to the operating-room?

DR. KRUG.—Yes. It is a rule of the hospital that each new case is to be examined on the next visiting of the attending physician, and the attending, is obliged to visit the hospital daily or, in case of illness or if he is prevented, to notify the adjunct or assistant adjunct in the mornings and ask him to take charge of the ward. So every case is examined beforehand, unless there should be cases of emergency admitted on the regular day of operation, then the house surgeon uses his discretion and makes the examination.

DR. DICKINSON.—Where is the division between gynecological and general surgical patients?

DR. KRUG.—The division is somewhat indistinct. The adjunct may send in cases which are not strictly gynecological. The general surgeons sometimes encroach upon our territory.

DR. GOFFE.—Are abdominal cases up to the diaphragm considered gynecological?

DR. KRUG.—Mostly. It depends on the diagnosis. (Laugh-

ter). As between appendicitis, pyosalpinx, and ectopic gestation, it is sometimes very difficult to make a differential diagnosis. We sometimes get a case of plain appendicitis to operate on, but not as often as ectopic cases, for instance, are operated on in the general surgical service.

DR. GOFFE.—How about the breast?

DR. KRUG.—It seems to me it is considered a general surgical case, but either one connected with the attending staff has a perfect right to send a case in of mammae and operate that case himself.

DR. DICKINSON.—You do not take obstetrical cases?

DR. KRUG.—Except on emergency.

DR. BOLDT.—If gynecological cases associated with other surgical conditions come in where are they sent?

DR. KRUG.—They would not be sent to the gynecological division from the admitting-room, but one can send them to his service.

DR. DICKINSON.—What committee of surgeons regulates the operating-room methods and technic? Are the rules printed?

DR. KRUG.—Each attending has a right to use his own technic. Each room is under the direction of the executive committee of the medical board.

DR. DICKINSON.—Is there any general agreement or adjustment by which you use certain varieties of catgut, ligatures, needles, etc? Are these lists typewritten?

DR. KRUG.—This is agreed upon by the use of the ordinary suture material. Anyone, however, can use what he prefers. Some prefer silk, some catgut, and some iodine catgut, and this is also obtained for him. The house staff is familiar with the method of each attending and there is no dispute about it. There is a general understanding between the two gynecological divisions. For about two years on my service we have given up scrubbing with soapsuds and water, and we rely entirely on the iodine method. I can recommend it as the most practical method. It saves time, and I think not only time but a good deal of narcosis and ether. It also reduces to a considerable degree the distention and the blood-vessels of the superficial layers. Also it is important in a case, for instance, where you start operations on the vagina and you find it necessary to change to the abdominal route. If you begin by washing it dry with ether, and finally painting it with the tincture of iodine you have prepared the field of operation just as thoroughly as after ten minutes' scrubbing with soap and water.

DR. DICKINSON.—Do the nurses object to the stain of iodine on the sheets?

DR. KRUG.—It comes out in the wash, so what's the difference.

DR. DICKINSON.—Do you wait ten minutes?

DR. KRUG.—The patient is painted with iodine in the morning, and a dry sterile dressing applied. When the patient is brought to the operating-room one other application is made.

DR. BOLDT.—No washing at all?

DR. KRUG.—In emergency nothing is done but painting with the application of tincture of iodine. The parts are shaved. I have tried in one case recently to use the iodine method in vaginal operations, and while I was surprised there was no special pain complained of afterwards, I think that operating in the vagina, the dark brown in the vagina absorbed a great deal of light and I found that it was rather difficult to operate. With the exception of doing a posterior vaginal incision for abscess, I would not recommend it.

DR. BOLDT.—I would like to know whether you have not observed from that preparation any abdominal suppuration?

DR. KRUG.—Absolutely none in clean cases. There is not much exfoliation. Very blond patients will exfoliate more than brunettes, but it seems to me it never is any worse than what you see with thorough scrubbing, and I have never seen severe cases of dermatitis as I have seen it from moist soap suds. I am not ready to say how many cases I have seen, but quite a large number.

DR. TAYLOR.—How large an area do you paint with iodine?

DR. KRUG.—If you have a big fibroid, or you think you must make a large incision, you paint the entire abdomen wherever your hands would touch.

DR. WARD.—In the last number of "*Surgery*" there was an abstract of an article on this subject. Some experiments were made by some German investigator, and it was decidedly not satisfactory according to his tests.

DR. KRUG.—That is the first I have seen against it. The literature is a very large one on the iodine method, and I have only recently glanced over a paper read by Dr. Stone and he quotes a great many. Sections show how deeply the iodine gets into the skin.

DR. BOLDT.—It seems to me there must be some difference in regard to the application of iodine as to whether the skin is perfectly dry. I myself have been unfortunate enough to have serious abdominal suppuration in one of the hospitals with which I am connected, and they maintained in that hospital that the suppuration was due to the use of iodine. I took up the question a few days ago with a surgeon from the west, and he maintained that when the patient is not thoroughly washed beforehand as with previous methods of operation and only painted with iodine that then we are very prone to have suppuration in the abdominal wound. There does seem a difference as to when the iodine is applied and what preparation there is beforehand.

DR. KRUG.—To my mind it is absolutely wrong to do any scrubbing in the usual way beforehand, whether in the morning or shortly before operation, because in doing that you fill up those interstices of the skin. You fill them with the detritus and soap. You fill those pores and your iodine has no chance to go in there, but if you will wash that skin dry with ether and then paint you iodine on, your iodine soaks in there and creeps into the smallest interstices and kills all the pathogenic bacteria.

They may be hidden. The second painting is much more effective although it is not absolutely necessary because in case of emergency we have done nothing else but wash the skin with ether and paint with iodine and no suppuration has followed.

DR. JEWETT.—My experience with iodine has been most satisfactory. I have followed the method of painting the abdomen several hours before the operation and painting it again just before operating. In a few cases I have had the abdomen scrubbed in addition, but I have not had any difference in results. In a very few of these cases I have had a very little suppuration from the wound, but I have not had any more than two or three cases altogether of suppuration in those cases in which the apparent cause was not given. It is so simple, it saves a great deal of time, and I am sure it is more effective than the scrubbing methods we ordinarily use.

DR. BROWN.—I would like to ask Dr. Krug how long he allows his skin stitches to remain in.

DR. KRUG.—I prefer catgut stitches. Of late I have become very partial to the iodine catgut. It does not become brittle.

DR. GOFFE.—I would like to ask if any of the surgeons have tried washing their hands with tincture of iodine.

DR. KRUG.—Yes. With ammonia you can get rid of the discoloration.

DR. GOFFE.—Did it seem to work pretty well on the surgeon's hands?

DR. KRUG.—Rubber gloves are pretty good.

DR. GRAD.—Do not two applications cause blisters?

DR. KRUG.—I have never seen it, or dermatitis, but in some instances the epidermis comes off in complete layers.

DR. GOFFE.—Do you use regular tincture of iodine?

DR. KRUG.—Ten per cent., usually.

DR. STUDDIFORD.—As to the arrangement of assistants at the operations, how much are the house staff to do?

DR. KRUG.—The house surgeon is the regular first assistant in every operation. The senior hands, the instruments. We have two paid anesthetists, mostly from the alumni of the hospital, who, when the service changes and when new men come on the service, teach and supervise the narcosis. Then, of course, in difficult cases we can always call on one of the adjuncts, perhaps, to assist at the wound, but as a rule it is the house surgeon who is first assistant at the wound.

DR. STUDDIFORD.—He does no operations except under supervision?

DR. KRUG.—Yes, that is it.

DR. BOLDT.—Is it a rule that a member of the attending board must be present at an operation?

DR. KRUG.—Yes, or in the house at least; and, then, the house surgeon is two and a half years on the service. He has had a continuous service of two years in the hospital before he becomes house surgeon, and he has gradually become more and more familiar with the operation-room and with everything, and it is

entirely within the discretion of the attending or adjunct, whoever is in charge of the operating-room on that day, to let him do just what he thinks he can do safely and what he is entitled to do.

DR. EDGAR.—Does the ordinary rule of the hospital, that one of the attending staff must be present for every case, apply in all cases?

DR. KRUG.—No. It is supposed that one of the attending or adjuncts must be in the house. It is an unwritten rule that does not appear on the records of the institution.

DR. DICKINSON.—The Society is greatly indebted to the surgical staff of this hospital for the demonstration and discussion of their methods.

Gentlemen: Dr. Mandlebaum, who is in charge of the laboratory, at the instance of the chair, kindly invited us to see his laboratory and exhibit some of those things which have a practical bearing on our own work. It becomes more and more important for us, the operators, clinicians, diagnosticators, to call upon the pathologist. They are teaching us constantly some of the most important things we know. Therefore, we should be more in touch with them. Too few of us visit laboratories. I think too few of us have knowledge of some methods about which we talk glibly. I am sorry we could not persuade Dr. Mandlebaum to give us a whole evening of talk and demonstration on those points wherein practical gynecology comes in touch, in daily contact, with bacteriology, clinical diagnosis, and pathology. Details of laboratory methods it would be, of course, impossible for anyone to take up or more than touch upon. It was suggested that from these printed questions on the program, Dr. Mandlebaum might get some hint as to what would be of interest to us.

LABORATORY METHODS.

DR. MANDLEBAUM.—When the laboratory was asked to cooperate at this meeting, I was told I might talk upon any topics that would be of interest, and I am somewhat surprised to see that this invitation calls for a great many things that I would rather not talk about in a meeting of this kind. However, I think that I can go into some points, and after I have talked to you for a little while, I wish to show you through the laboratories upstairs where I have a very nice display of specimens, forty or fifty, which I am sure you could spend two hours looking at very profitably if the time permitted.

Concerning the value of the Wassermann and other serum tests in determining the heredity of syphilis and as the cause of repeated abortions, I should like to say that the whole question of the Wassermann test is still young and we have not very much statistics. However, during the past week we have made tests on two cases where there was a history of repeated abortions, and both of them gave positive tests. Altogether we have in the last six or eight months perhaps five or six cases where that

obtains. I might mention incidentally that in the past fifteen years I have never met with a single case where the material from a curettage, for instance, would suggest syphilis until about a month ago when in examining some material from Dr. Brettauer's service my suspicion was aroused from the peculiar appearance, and in making the serum test we found the patient reacted.

As to the value of gonococcus tests, difficulties, etc., I should say that we have taken unusual steps in making the examination here of a woman suspected of having gonorrhea. We have scrubbed the entire genitals as if we were going to operate; that is, we have scrubbed with soap and water, and then washed out the vagina with a solution and then, after the special cleaning of the meatus, we introduced a platinum loop there and repeatedly got gonococcus in that way. If one does not take that precaution the bacteria flora are so tremendous we might overlook the gonococcus. We have done the same thing in examining the cervix. After getting rid of the mucus we have by introducing the loop into the cervix gotten gonococcus where I am sure we would not have been able to demonstrate them otherwise. We have examined both by smears as well as by making serum cultures on proper culture mediums.

In office laboratories the question is asked if it might not be practicable to do that kind of preliminary scrubbing. However, there I think a few free smears made with proper care, getting rid of the excessive secretion covering the vestibule, one might find them in that way.

As to the methods to be employed by the clinician or operator for temporarily preserving specimens that is quite a large question, and it has been subdivided into several sections. To urine, if it is to be sent any distance, especially in warm weather, it is well to add a very small amount of chloroform or even formalin. Some recommend a crystal of thymol. Of course, if one wants to make a bacteriological test and grow the organisms he could not do this but it does not interfere with the ordinary routine.

Curettage Material.—In this I might say one is often confronted with material having more blood than curettings. I think if the operator would differentiate between the amount of blood and material and only send the tissue to the pathologist, it would lessen the latter's labor. The curettage material ought to be placed either in formalin or 50 per cent. alcohol. Here, very often where it is a short distance between the operating-room and the laboratory, we frequently get our material in the fresh state and can select what we desire.

Polyp should go in formalin or alcohol.

As for section of the cervix, the question is asked how much is needed, and I would say the more the better. Usually we like a section that goes into the cervix, a wedge-shaped section, if possible. If one gets a suspicious growth, he may, if not careful, be having simply some of the epithelial proliferation.

Smears ought never to be fixed through a flame. They ought

to be made as often as possible on slides, not fixed through the flame. Very often we want to stain these smears and some methods cannot be properly fixed by heat. That would apply also to pus chancre if it was in the nature of a smear, but if you have enough material from the supposed chancre that must always go in formalin because if one is to stain cut sections for the spirochete you can only discover the organism if the material is fixed in formalin, never in alcohol.

Gross specimens ought to be sent in in the fresh state with a history of the case. We are able in that way to see what the material looks like in the gross state and select our own sections. If the large specimen is sent to us in fluid it very often is improperly fixed and we cannot determine the exact original condition.

On account of the color changes and otherwise I sometimes would like to warn you in this connection about placing a specimen, no matter of what kind, in a jar and leaving it there some little time and adding alcohol to it. It is a very faulty way. The specimen has a great tendency to adhere to the bottom of the receptacle and the alcohol or other fixative does not encircle the specimen. Sometimes very valuable material is lost in that way. If specimens are to be sent to the laboratory for mounting, especially to preserve color, they should either be sent in the fresh state or in formalin, never in alcohol, because the preliminary step is the fixation with formalin, but specimens should not be allowed to remain in this solution too long. The ideal way is to have them in formalin only for twenty-four hours before going into the successive fluids. So it is a good thing to get them to the laboratory as soon as possible. Fresh specimens are always preferable.

All curettage material should be sent as a routine procedure. We examine it from every curettage regardless of what the case may be. I think we get most of the tubes and all of the fibroids are sent to us. We do not always find any necessity for examining them histologically, some of them are so plainly evident. All ovarian cysts come to us. They usually come to us open so we do not see the contents. The operator usually wants to see that in the operating-room. I might say in this connection that tubes ought to be sent to the laboratory if cultures are desired, unless competent persons can make the culture in the operating-room. Sometimes, if they are sent to us open and the contents escape, our results are not good.

In our puerperal sepsis cases, we always make blood cultures. Smears really do not tell us very much.

I have no acquaintance with the use of the freezing microtome for the gynecologist. I do not believe that I have ever made an examination. In the general surgical service we do it repeatedly, especially on tumor of the breast, but I should not like to be called upon to give a diagnosis, for instance, of any curettage with the freezing microtome. I think that would be a little risky thing to do. I think in all cervixes in which there is a fragmentary tissue, I would be willing to make a diagnosis for or against car-

cinoma, but in curettage unless one get a tolerably firm piece of tissue, I would rather not be called upon to do that. So far as time goes we can obtain, from material such as the breast, the result inside of five minutes, and the results are always good, that is, diagnosis has invariably been confirmed by the examination of the hardened and fixed material subsequently.

DR. DICKINSON.—How do you divide your clinical work from the pathological work?

DR. MANDLEBAUM.—That is accomplished in this hospital as follows: The house staff have too clinical laboratories here where they do the clinical microscopy for the service, and they examine all the urine, all the sputum, feces, stomach contents, and blood. They make all the clinical examinations unless unusual cases come up and unless unusual finds are reported. Then the laboratory is asked to look over that material and corroborate the reports of the house staff. The work the pathological department has to do is everything else so far as investigation goes, but those things are left to the house staff.

DR. DICKINSON.—What can cheap labor do? Is it wise to call on the time of the medical college to make albumin tests and sugar tests for instance? Can the stenographer type of woman do a good deal of routine work and free the house staff and the resident pathologist for better work and higher class of work? I saw a pathologist laboriously doing routine work recently which it seems to me the cheap salaried person could undertake.

DR. MANDLEBAUM.—In our laboratory the men at the different departments attend to the routine work. This laboratory has a force of seventeen workers and four orderlies, and so we personally do not have to do this. I should not consider it wise to have a diener do the work for the house staff in an albumin and sugar test. I think in a physician's office that some one could do that for him if he had a large amount of it. Here we have a young woman, whom we call a technician, do much of our routine work, so far as cutting material, preparation of sections, staining, etc., but we have such a large force of voluntary workers who are very glad to come to the laboratory for six months that we have not this trouble.

DR. DICKINSON.—Although we may throw up our hands, we of the small salaries and small hospitals, to see this ideal work, it should rather set us to the task of inspiring our trustees with the idea that is the way the thing ought to be done, that this work is the step forward we are all to make. It seems to your president that the pathologist will never have the importance he should have until the financial end of this is cared for fairly. Any help that the Doctor can give us on the matter, of how to finance our laboratories, how to make our struggling pathological departments more efficient, how to inspire trustees with the idea they ought to pay salaries, are things we ought to know.

DR. MANDLEBAUM.—The best way to finance the laboratory is to have it endowed. We have not got to that point yet, but

we hope to. The expense of running a laboratory is not a small item. The expense here has increased year after year, and so it is quite an item in the yearly expense of the hospital. It is proper to pay as many men to work in the laboratory as the trustees will stand for. I think it is a fair thing to pay at least six men provided you have a working staff of ten or twelve. In that way you can control the time of the men, and here in this laboratory all the men connected with it are in practice including the pathologist. The hospital has not arrived at that stage yet where they feel as if they wanted to have the men devote their entire time to the work, and naturally with some men, the young men on the staff, they will not allow their private work to interfere, but rather they will not allow their laboratory to interfere with their private work, and whereas we expect them to work from two to four or five hours a day, sometimes it is quite an effort for them to give us that amount of time. If fair salaries were paid these men they would be willing to give up some of their work.

DR. BOLDT.—I would like to know whether the private hospital patients pay these laboratory men a separate fee or whether that fee is included in the surgeon's fee.

DR. MANDLEBAUM.—In this hospital both those methods obtain. At times the pathologist is asked to send his individual bill for services, and at times the surgeon includes the pathologist's charge in his bill and remits to him. Both methods are followed. That is left open to the individual case. There are no rules governing the relation of any of the attending staff with private patients. The hospital has no rule for the financial end of that.

DR. EDGAR.—The Doctor has referred to formalin a number of times. May I ask what strength?

DR. MANDLEBAUM.—Ten per cent. formalin solution, equivalent practically to 2 per cent. formaldehyde. This works out one part of commercial formalin to nine of water. The specimens should not be retained more than twenty-four hours if they are to be preserved in their natural color.

DR. WARD.—Has he ever gotten the Wassermann test in a case of a mother apparently free from syphilis whose baby was infected?

DR. MANDLEBAUM.—None that I can recall. As I said when I prefaced my remarks on the Wassermann test, we have not made enough of them to draw any conclusions.

DR. BOLDT.—The freezing microtome has been spoken of. I myself have had a few instances during the past few years where the freezing process has been of benefit to me in cases of incision of the cervix. In curettage, however, it has been absolutely useless. The question arises, is it wise to place these specimens in glycerine in making a diagnosis? More recently pathologists, as a rule, have declined to make a diagnosis from a specimen in glycerine.

DR. MANDLEBAUM.—We never use that here, and I do not think anyone would at the present day use that method. We would not trust a fresh piece of unstained tissue.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of April 28, 1910.

S. M. BRICKNER, M. D., *in the Chair.*

PRELIMINARY REPORT UPON THE USE OF OXYGEN IN ASPHYXIA NEONATORUM.

DR. FREDERICK C. HOLDEN said that although not in itself a purely obstetrical subject, nevertheless all obstetricians were directly concerned with the treatment of asphyxia of the newborn. The condition was one of oxygen starvation plus carbon dioxide poisoning, produced by numerous causes; and the two types, the livid and pallid, were different degrees of the same process. With the better understanding and application of obstetric indications in recent years, many of the causes of asphyxia and destructive operations upon the fetus were things of the past. Many methods had been proposed to overcome this condition. That of Schultze was often used, yet it was not without danger as was shown by the recorded instances of fractured clavicle with perforation of the lung, dislocation of the shoulder, ruptured liver, and injuries resulting from allowing the slippery infant to escape from the hands and be thrown to the floor or against a wall. Direct insufflation was open to criticism since the air injected into the infant's lungs was charged with carbon dioxide and loaded with millions of microbes of many varieties. Sylvester's method was rarely effectual in the newborn, and it was a waste of valuable time to use it. Realizing that the predominant causative factor in these cases was a deficiency of oxygen, two years ago he began the use of oxygen for the purpose and had found it of decided advantage. Immediately following the birth, the procedure was as follows:

Holding the child in the inverted position with the left hand, after having wrapped a towel around the feet to prevent slipping, the mucus was removed from the mouth and nostrils; if there seemed to be an abundance, its removal was facilitated by having an assistant compress the chest while still in the inverted position, as suggested by Prochownik. The back should then be rubbed or slapped and, if the child then failed to breathe or cry, the cord should be cut. The infant was then tubbed in hot water, 105° F., and the method of Byrd followed, which method consisted, briefly, in alternately folding and unfolding the child like a book. This method was carried out

while the child was still in the water, with the face held above the surface. While this treatment was in operation, a funnel, either of glass or rubber, about 3 or 4 inches in diameter, attached by rubber tubing to a tank of oxygen, was held as closely as possible over the child's mouth and nose, and the oxygen allowed to flow very freely, in fact at full force. The irritation to the respiratory tract produced by the oxygen caused rapid respirations and crying, with full expansion of the chest; the oxygen was continued, and the pallid or livid hue in a few seconds gave way to a most welcome bright and rosy color. Occasionally in extreme cases he used Laborde's method, rhythmic traction on the tongue, eight or ten times a minute; this could best be accomplished by means of a suture through the tongue, in conjunction with Byrd's method, and with the funnel still at the mouth. After respiration was well established, the child was removed from the tub, dried, the cord dressed, and when well wrapped was laid on the right side with a hot water-bag to the back. It was a good plan to make these children cry once an hour for several hours.

To sum up: An insufficiency of oxygen being the cause of asphyxiation in the new-born, the manner of using it seemed a reasonable procedure; it was harmless, it greatly lessened the exposure and eliminated the traumatism that resulted from the use of some methods; it saved valuable time, and it gave living children when other methods failed.

Dr. J. O. Polak said that he was at first rather skeptical regarding the value of this method described by Dr. Holden, but he had seen a great number of cases resuscitated, and it was amazing to see the quick change in the color and the pulse rise ten or twenty beats. What the doctor had so far done had been done in the rough and there were many modifications yet to be made before the method was perfect.

SPONTANEOUS INTRAPARTUM RUPTURE OF THE UTERUS, DUE TO ABSENCE OF THE VAGINA.

Dr. LOUIS J. LADINSKI presented this patient and specimen. The patient was twenty-three years old, married eleven months. At the age of thirteen she began to suffer from abdominal cramps, occurring periodically every month, but not accompanied by vaginal bleeding. This continued up to her fifteenth year, when she consulted a specialist; he performed some operation, the nature of which she did not know. Since the operation she menstruated every four weeks; the discharge was moderate in amount, and she had no pain. She was sent to the Beth Isreal Hospital during the night of March 28, 1910. Dr. Ladinski saw the patient for the first time on the day following at 4 P. M. The physical examination revealed an abdomen with all the signs of a full-term pregnancy, with the fetus in the normal position, vertex presentation. The external genitalia were

normal. About $1\frac{1}{2}$ inch above the introitus vaginae there was a thick septum, in the center of which was an opening about $\frac{1}{4}$ inch in diameter. By rectal examination no vagina or cervix could be palpated, but the fetal head could be distinctly felt pressing against the septum. As there were no signs of any threatened labor pains, he ordered the patient to be prepared for a thorough examination under anesthesia and for operation according to indication on the afternoon of the next day. Late that night, however, the patient began to have slight labor pains, which continued until 1 P. M., when the report was sent him that they were becoming quite severe. He ordered that the patient be at once prepared for Cesarean section. Before reaching the hospital, however, during one of her labor pains, without any warning, the patient suddenly went into collapse, became cyanotic, with a very rapid uncountable pulse. about 2 o'clock the entire abdomen was found to be tense and distended; the fundus uteri could not be felt at all; the epigastrium was bulging, tense, and dull. The fetal contents could be made out with great ease right beneath of abdominal wall. There was also marked flatness in both flanks and lower abdomen. Laparotomy was at once performed. The peritoneal cavity was found distended with a large amount of free and clotted blood. The body and extremities of the fetus protruded through a rent in the anterior wall of the uterus; the head was still grasped by the contracting ring of the lower segment of the uterus and cervix. On withdrawing the fetus the placenta followed.

An examination then revealed the uterus low down in the pelvis, hard and contracted, with a complete transverse rent at the level of the junction of the body and cervix extending through the entire anterior wall and embracing part of the posterior wall, so that the uterus remained attached to the cervix only by a narrow isthmus posteriorly. Large pedicle clamps were applied to the stump of the cervix, temporarily checking the bleeding; the remaining band of tissue between the uterus and cervix was cut through, and the uterus was removed. This was a case in which there was a complete absence of the vagina, the cervix uteri extending down to the introitus vaginae. The dilated os would not serve for the entrance of the vagina and the cervical canal for a substitute vagina.

ABSENCE OF VAGINA: RUDIMENTARY HORN OF UTERUS: VAGINA
CONSTRUCTED BY COMBINED PERINEAL-ABDOMINAL ROUTE:
THIERSCH' SKIN GRAFTS USED.

DR. LOUIS J. LADINSKI presented this patient. She was twenty years old, single. She had never menstruated, but had had menstrual colic once every four weeks, characterized by cramp-like pains in the abdomen, lasting from one to two hours. The external genitalia were normal. The introitus vaginae was represented by a shallow vestibule, in the center of which

and about $3/4$ inch below the meatus urinarius was a very small sinus which admitted a probe to a distance of $1/2$ inch. The perineal body was small, thus making the distance between the urethra and the anus shorter than normal. The rectal examination failed to show the presence of a uterine body; the adnexa, however, were palpable.

Operation was performed August 4, 1909. Laparotomy was performed and the pelvic examination revealed the following conditions. Both tubes and ovaries were present, the latter showing decided signs of ovulation by the presence of corpora lutea; the uterus, however, was absent, and in its stead were two rudimentary horns, each situated laterally and joined by a broad thick membrane which extends downward to the junction of the bladder and rectum. This septum was incised along its upper border extending transversely from one rudimentary horn to the other. By blunt dissection the two layers of the septum were separated until a line of union of bladder and rectum was reached. The bladder was then carefully separated from the rectum down to the floor of the pelvis, showing both ureters very distinctly. The dissection was carried down to within a few inches of the introitus vaginæ. The space was then packed with iodoform gauze, and its upper border closed with a few sutures. The abdomen was closed in the usual manner.

The patient was then placed in the lithotomy position and a transverse incision made into the vestibule. This incision was gradually deepened by separating the bladder from the rectum by alternating sharp and blunt dissection, and by using the gauze packing in the upper cavity as a guide until a communication between the two channels was established. The newly formed vagina could now easily admit two fingers to a depth of about 8 or 9 inches. The new vagina was packed with iodoform gauze. On August 17, the granulating cavity was covered by skin grafts; this was not successful. On September 7, skin grafts placed upon sterile silver foil with raw surface up was done and with a very satisfactory result, most of the grafts taking.

Dr. Landinski, presented another similar case.

RUPTURED TUBAL PREGNANCY. DEATH WITHOUT OPERATION.

DR. PHILANDER A. HARRIS exhibited a specimen consisting of the uterus, tubes, and ovaries removed at autopsy; death having been due to ruptured tubal pregnancy, and presumably not advanced beyond two or three weeks of gestation. The growth occurred in the isthmian portion of the left tube so well in the uterus as to probably constitute a so-called cornual pregnancy. This patient was perfectly well until about 4 o'clock in the morning, at which time she was seized with very severe colics and was attended by her physician until she died at 11 o'clock that morning, just seven hours after the first symptoms. She was

believed by her physician to be suffering from a criminal abortion and probably on that account tubal pregnancy was not diagnosticated. The patient denied any history of interference. Dr. Harris was asked to be present at the official autopsy. There was found in the abdominal cavity several quarts of dark blood and many clots. A median line anterior section of the corpus, fundus, and cervix uteri shows the presence of a very considerable decidual formation in the cavity of the uterus, and presenting no evidence whatever of intrauterine traumatism. This case was reported by Dr. Harris as an instance of very prompt death from ruptured tubal pregnancy without surgical interference.

OVARIAN PREGNANCY.

DR. GEORGE H. BALLERAY reported the case of a woman, forty years old, married ten years, but never pregnant. After skipping her menstrual period two weeks, she had an irregular discharge of blood. She then went one month without seeing anything. Then she had a moderate discharge of blood which lasted four or five days. Two weeks later she had an intense pain in the abdomen, for which morphine had to be given, but this relieved her for a time only. This was followed by much abdominal distention and vomiting. Two weeks after this she was able to be about and on her feet. Two weeks later she was again seized with pain and another physician saw her. She became very much distended and she vomited incessantly. She was then sent to the hospital. On examination, nothing was to be felt from below. She had an old salpingitis and an old peritonitis. Palpating her above showed the abdomen to be very tender and distended and he was unable to map out anything. Her temperature was about 100° F., pulse from 120 to 126. She was nourished by rectum for a few days. She had sordes on her teeth, her tongue was dry and she had the usual symptoms attending the so-called typhoid state. Her bowels were washed out, and she gradually improved. After three weeks a distinct mass was felt distinctly on the left side. The abdomen was opened and very extensive and dense adhesions were encountered. The mass was removed and was apparently a four-months-old fetus. Outside the mass the tissue was made up of ovarian tissue. Dr. Balleray said he had always maintained that there was no such thing as a true ovarian pregnancy, but from a study of the gross anatomical conditions that were presented, he believed that this was a true ovarian pregnancy.

INTERSTITIAL PREGNANCY.

DR. J. O. POLAK presented a specimen that he had removed but a few hours before the meeting. The patient was thirty-four years of age, married five years, had two children, the last on February 26, 1910. On April 4, she bled for a few days. She was admitted to the hospital where she remained but a few days,

a diagnosis not being made; she was discharged "cured" after two weeks in the institution. She had attacks of pain. Intermittent bleeding continued. Yesterday she bled very profusely. At 8 o'clock this morning she entered into a state of collapse with severe abdominal pains. She was brought to the hospital in a state of shock. He removed the uterus. The specimen revealed an interstitial pregnancy. This would be subjected to the pathologist and a further report made.

ECTOPIC GESTATION FROM THE STANDPOINT OF THE GENERAL PRACTITIONER.

DR. GUY L. HUNNER, of Baltimore, read this paper. (See page 409.)

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of May 26, 1910.

S. M. BRICKNER, M. D., *in the Chair.*

COMPLETE ABSENCE OF THE VAGINA AND UTERUS IN AN OTHERWISE NORMAL WOMAN.

DR. MEYER FRANKEL, by invitation, presented a patient twenty-five years old, married two years. She had a sister who had not menstruated although she was now sixteen years of age. The patient had enjoyed excellent health, but she had never menstruated. When nineteen years old she consulted a physician because of amenorrhea. She was operated upon and advised that she could marry. Her chief complaint was severe pain on intercourse. Examination showed a complete absence of vagina and uterus. The clitoris was present and the woman had desire for intercourse. A rectal examination showed the absence of the uterus. During her two years of married life the husband had attempted intercourse; as a result, during his orgasm, the semen was injected into the bladder, and the sphincter of the bladder had become overdistended, lowering its tonicity to such an extent that the woman could not retain her urine. After keeping her husband from her for six months she now could retain her urine. Dr. Frankel asked the Chairman if there are any cases of artificial vaginæ on record made by intestinal transplantation, or by the method of Dr. J. F. Baldwin of Columbus, Ohio.

DR. BRICKNER, in reply of Dr. Frankel's question, said he was not familiar with any such cases.

DR. L. J. LADINSKI presented several specimens:

CHORIOEPITHELIOMA.

A woman, forty-six years old, had been married twenty-eight years. She had had ten children, the last one seven years ago.

She had never aborted. She began to menstruate at the age of fifteen, was regular, and flowed seven to ten days. About one year ago she noticed that her abdomen began to increase in size for a period of seven months, simulating a pregnancy, and this was accompanied by irregular spotting and bleeding. In Canada she was curetted, after which the bleeding stopped and did not recur until three months ago. At that time spotting returned, accompanied with pains in the right iliac region, marked weakness, anemia, and slight cough. At the time of admission the patient looked pale, anemic, and had slight edema of the lower extremities. There were subcrepitant râles over the right apex of the lung posteriorly. The spleen, liver, and abdomen were negative. The uterus was enlarged, corresponding to a two months' gravid uterus. The anterior and lateral walls were normal in consistency, but there was a boggy mass in the left lateral wall about the size of a hen's egg. The cervix was eroded and lacerated. The urine was negative. A diagnosis of uterine myoma was made. The curettings consisted of a large amount of endometrium. On March 1 the patient was operated upon. With the patient in the Trendelenburg position the abdomen was opened and the pelvis exposed. This revealed a soft tumor at the left of the uterus, intimately adherent to the left side of the uterus and extending into the broad ligament subperitoneally. The ovary lay posterior to the tumor and the Fallopian tube was stretched across its upper and anterior surface. A supravaginal hysterectomy was performed in the usual manner. On the day following the operation the patient suffered from slight shock and from a brachial palsy of the left upper extremity. The next day her condition improved, but she complained of pains over the precordium, she coughed, and she expectorated a large amount of bloody sputum. The examination of the lungs revealed a marked infiltration over the right apex, and in the sputum was found a large number of Lenard cells. On March 7 the x-ray examination of the lungs showed an infiltration of both, particularly of the lower lobes, but more marked on the right. This infiltration was not miliary in character and the mediastinum was found to be involved. The pathologist reported this to be a case of chorioepithelioma, and the curettings showed the presence of a chronic endometritis.

The entire left broad ligament was occupied by a spherical tumor which extended from the left border of the uterus outward to the infundibulum ligament. It measured 7 1/2 inches in length and 8 inches in width and 6 1/2 inches in thickness. The Fallopian tube coursed over the upper surface and a small remnant of the ovary was attached to the posterior and upper aspect. The surface of the mass was made up of the bulging layers of the broad ligament and was perfectly smooth. The tumor possessed firm consistency. On section, the color was mottled, being hemorrhagic in some spots and whitish in appearance in

others. The hemorrhagic areas were particularly notable at the periphery. The only sites where tumor elements were present were at the extreme periphery of the tumor. The tumor consisted of three types of cells: 1. Large and round cells of an epithelioid conformation. The cytoplasm stained pale, the nucleus was vesicular, poor in chromatin, and possessed a distinct nucleus. Mitotic figures were abundant. 2. These cells were syncytial in character, and consisted of large protoplasmic plaques, the cytoplasm of which was acidophilic and finely granular. 3. Large oval giant cells, containing either a single large or two smaller deeply staining nuclei and having a strong resemblance to the chorionic wandering cells.

BLEEDING FROM CORPUS LUTEUM.

The patient was twenty-two years of age. She had sharp attacks of pain in the lower right abdomen which existed for about three months before she entered the hospital. The pains were specially severe on the right side, radiating to the back. The pains were followed by syncope. There was no vaginal bleeding. The abdomen was moderately distended. There was tenderness over the lower half of the abdomen, most marked in the right inguinal region. No distinct masses were to be felt. Per vaginam there was a sense of fluctuation in the right fornix, and the uterus was felt to the left. This was regarded as a case of ruptured tubal pregnancy. Laparotomy was performed and there was found a large amount of free blood, fluid and large blood clots. A parovarian cyst on the left side was noted, about the size of an orange. True ovarian tissue appeared at one portion of its surface. A corpus luteum 1 cm. in diameter was observed to be actively bleeding.

COMPLETE ABSENCE OF VAGINA. PREGNANCY. RUPTURE OF UTERUS.

The woman was twenty-three years old, and had been married eleven months. At the age of thirteen she began to suffer from abdominal cramps, occurring periodically every month, but not accompanied by vaginal bleeding. This continued up to her fifteenth year when she consulted a specialist; he performed an operation the nature of which was unknown to the patient. Since the operation she had menstruated regularly every four weeks; the discharge had been moderate in amount, and without the presence of pain.

This patient was admitted to Beth Israel Hospital on March 28, 1910. On March 29, in the afternoon, he first saw the patient. An examination of the abdomen showed all the signs of a full-term pregnancy with the fetus in a normal position. The external genitalia were normal. About $1\frac{1}{2}$ inch above the introitus

vaginæ there was a thick septum, in the center of which was an opening about $1\frac{1}{4}$ inch in diameter. By rectal examination no vagina or cervix could be palpated, but the fetal head could be distinctly felt pressing against this septum. As there were no signs of labor pains he ordered the patient to be prepared for a thorough examination under anesthesia and operation, according to indications, on the afternoon of the next day.

Late that night the patient began to have slight labor pains, which continued until 1 P. M., when the house surgeon reported to him that they were becoming quite severe. Dr. Ladinski ordered then that she be prepared for Cesarean section. Before he reached the hospital, however, during one of her labor pains, without any warning, the patient suddenly went into collapse, became cyanotic, and had a very rapid uncountable pulse. Examination at 2 A. M. showed a marked change in the physical signs; the entire abdomen was tense and distended; the fundus uteri could not be felt at all; the epigastrium was bulging, tense and dull on percussion. The fetal parts could be made out with great ease right beneath the abdominal wall. There was a marked flatness in both flanks and lower abdomen. A diagnosis of ruptured uterus was made, and the patient was transferred to the operating-room.

The peritoneal cavity was found to be distended with free and clotted blood, and the body of the fetus and extremities protruded through a rent in the anterior wall of the uterus. The head was still grasped by the contracting ring of the lower segment of the uterus and cervix. On withdrawal of the fetus, the placenta followed.

The uterus was found to be low down in the pelvis, hard and contracted, but with a complete rent at the level of the junction of the body and cervix (Hegar's zone), extending through the entire anterior wall, and embracing part of the posterior wall, so that the uterus remained attached to the cervix only by a narrow isthmus posteriorly. The bleeding at this stage was very profuse and appeared to start afresh from the torn uterine vessels as well as from the torn edges of the cervix. Large pedical clamps were applied to the stump of the cervix, temporarily stopping the bleeding, and the remaining band of tissue between the uterus and cervix was cut through, and the uterus removed. After mopping out the blood and débris, a mattress suture was passed through the entire width of the stump near its upper edge, with the exception of an opening in the center which was utilized for drainage. The upper end of the stump was turned in and the peritoneal surfaces were united over it with catgut. Several cigarette drains were inserted and the wound closed in the usual manner.

This was a case in which there was a complete absence of the vagina; the cervix uteri extended down to the introitus vaginam. The dilated os would now serve for the entrance of the vagina, and the cervical canal for a substitute vagina.

CARCINOMA OF THE CERVIX ON THE BORDER-LINE OF OPERABILITY.

DR. HERMAN J. BOLDT presented a number of specimens. The patient was sixty-five years old and had three children, the last born twenty-eight years ago.

The first symptom of cancer, which consisted of a moderate loss of blood and was mistaken by the patient to be a return of the menstrual function, occurred five months prior to seeking medical advice.

Bimanual examination showed that the broad ligaments were involved slightly beyond their attachment to the cervix. The question that arose was whether under such circumstances it would be to the better interest of the patient to do a radical abdominal operation, or whether her interest would be better served by a palliative operation. Unfortunately for the woman it was decided to do the radical operation. The retroperitoneum was opened to carefully examine and remove any enlarged glands; none were found. The connective tissue in the true pelvis was, however, removed to some extent. In doing this the ureters were exposed up to the bifurcation of the iliac artery. On the right side the desirability of extirpating the terminal end of the ureter and making a reimplantation into the bladder was considered, but was not thought necessary. The woman passed but a small quantity of urine after operation, and made the impression that her death, on the fourth day, was caused by uremia.

While I have operated upon a number of patients with cancer on the border-line of operability, and as a rule the recovery from operation was satisfactory, yet it is not good surgery in my opinion, to operate such patients by the so-called radical method. From my observation their interest is better served if a palliative operation is done. First, because a palliative operation is almost entirely devoid of danger, and second, the lives of such patients are usually prolonged from one to three years; indeed, a number of instances have been recorded in which complete cure was established. A number of such reports were made by observers of international repute in the medical world, and should therefore receive credence.

CANCER OF THE CERVIX; EXTIRPATION BY THE ABDOMINAL ROUTE.

J. G., aged forty-two years. For four months the patient had atypical bleeding at intervals of about four weeks and each attack of bleeding was from six to seven days' duration. She had had three children; the last nineteen years ago. The cervix felt indurated and appeared suspicious of malignant disease, yet a positive diagnosis was not made until a piece was excised for diagnosis. A curetting was then done. The excised piece was sectioned after being frozen and a positive report was received

in about ten minutes, so that the operation for the removal of the uterus could be proceeded with. An attempt was made to remove the organ per vaginam because of marked obesity of the patient, but despite of an extensive paravaginal section it was found impossible because of immobility of the uterus, due to old adhesions and to inflammatory infiltration of the broad ligaments. The vaginal procedure was therefore discontinued after loosening the upper third of the vagina.

Even by the abdominal route the technical difficulty was considerable because of the adhesions and the broad ligament infiltration. No enlarged glands were felt on most careful examination.

The woman made an uninterrupted recovery.

Attention is called to the statement that the broad ligament infiltration was inflammatory, and not caused by malignant disease. It has frequently been asserted that such differentiation cannot be made. While this is correct for some cases, yet when we can elicit a history of old pelvic inflammation, and when we do not feel the unyielding board-like infiltration that one palpates when cancer is its cause, but feels rather an infiltration that has a slight degree of resiliency, it is fair to assume that there is a probability of its being the result of inflammation.

I again call attention to the necessity of invariably making a positive diagnosis in all suspicious cases.

MYOFIBROMATA COMPLICATED WITH CARCINOMA OF THE CORPUS UTERI.

F. Z., aged fifty-four years; has had four children, the last thirty years ago. During the last five months she had backache and atypical loss of blood. The examination of the interior of the uterus with a sound revealed the presence of a roughened area on the posterior surface of the uterus which bled readily. Under ether, a sufficiently large piece of structure was obtained with a curet to have a frozen section made, the report on which corroborated the diagnosis. Because of its being a corporal carcinoma, and because of the unusual obesity of the woman, a vaginal hysterectomy was done, although it was recognized that because of the increased size of the organ, due to myomata, the operation would be difficult. Unfortunately the bladder was extensively injured during the operation.

TWO COMPLICATED HYSTEROSALPINGECTOMIES.

Mrs. C. and Mrs. S. had been ill several years, the result of gonorrheal infection. From the specimens alone it may be seen how technically difficult the operations were. The unusually large pyosalpinges were universally adherent. Fortunately, such chronic cases have, as the result of long standing inflammation, much thickened walls, so that if one is careful in his enucleation the danger of rupturing the tubes during extirpation is not

great. But even though they did burst, the pus is usually innocuous. In both instances the intestines were slightly injured. There is no class of abdominal operations that is more difficult to do, from a technical point of view, than these old pyosalpinx cases. As a rule, however, there is no class of patients that one may get a more satisfactory symptomatic cure than in such conditions. The prognosis, moreover, is very good, better than in any other class of serious abdominal operations. This may be ascribed to the tolerance of the peritoneum in such cases.

MYOFIBROMA REMOVED BY EXTENSIVE MYOMECTOMY.

E. S., aged thirty-two years; two children, the last born three and one-half years ago. The chief symptom, the one indicating the necessity of an operation, was menorrhagia. Judging from the result of a bimanual examination, it was determined to do an abdominal extirpation of the myomatous uterus. When the abdomen was opened it was found that the tumor invaded only the anterior wall of the uterus; moreover, there was no macroscopical evidence of any additional myomatous neoplasm. Because of the age of the patient and of the favorable findings mentioned for a conservative operation, a myomectomy was decided upon. Enucleation proved, however, only partly possible, the tumor, as may be seen in the specimen, encroaching so extensively on the uterus that the larger part of the anterior uterine wall had to be removed with the tumor, so that when the wound was ready for closing the uterine cavity was diminished fully one-third of its former size. It will be interesting to watch the patient in the event of a subsequent pregnancy. It is likely that in the case of conception an abortion or a premature delivery would take place. The woman also had a complete perineal tear which extended more than 2 inches into the rectum, causing incontinence of feces during the previous seven years. Recovery was uninterrupted, including the relief of fecal incontinence.

MYOMATOUS UTERUS WITH ADNEXA REMOVED PER ABDOMINAL ROUTE.

The sole object in presenting this specimen, which was removed six months ago from a patient thirty-five years of age, is to say a word against removal of the ovaries, unless the glands are seriously affected; indeed, even if they are affected a part of functionating ovary should be retained whenever feasible. In this instance an exception was made to my customary rule of retaining the ovaries in myofibromatous tumors because of the constant pain that the woman complained of in the region of the ovaries in addition to the symptoms caused by the tumor. Since the operation the patient is in a deplorable condition, because of the psychosis brought about by the removal of the ovaries. While some nervous disturbance may be, and often is,

present as the result of extirpation of a myomatous uterus, yet never has such intense disturbance been seen in such instances as in a number of patients in whom the glands were also removed.

SUBMUCOUS MYOFIBROMA AND TUBAL PREGNANCY.

E. P., aged forty-one years; married nineteen years; three children, the last nine years ago. The menstrual history prior to the present illness is negative. Her illness began four weeks ago with a muco-sanguineous discharge, not accompanied by pain; the discharge continued two weeks and then profuse uterine bleeding began which was associated with pain in the lower abdomen. From that time on until the time of consultation on May 2 the woman continued to have pain of labor-like character at irregular intervals. The attacks of pain continue about half an hour and are accompanied by vomiting. The blood is thicker and darker than at former menstrual periods.

From the history the diagnosis was probable extrauterine pregnancy. An incomplete abortion was also thought of, but was not thought to be present because no tissue had been passed at any time.

Examination showed the characteristic findings of a myofibroma, about six centimeters in diameter, and probably of the submucous variety. With such diagnosis the symptoms were readily explainable. The "symptom diagnosis" of tubal pregnancy was therefore dismissed from consideration.

When the abdomen was opened, it was found to contain old and fresh blood, clots and fluid; in quantity about 300 to 400 c.c. The left Fallopian tube was distended by the tubal mole.

Last September a curetting had been done on the patient and the specimen was examined by a pathologist of high repute; it was pronounced suspicious of malignant changes. In view of the tumor, in connection with the report shown me by the family physician, it was decided to extirpate also the uterus. The recovery was uninterrupted.

The particular feature of interest is the diagnosis, which should have been easy to make in this instance, if one would have thought of the two conditions as occurring together, instead of attributing the symptoms to the myoma alone.

TUBERCULOUS PELVIC ORGANS, WITH AN UNUSUAL HISTORY.

S. J. consulted me because of sterility on February 1. The uterus was found to be a trifle smaller than normal, and the ovaries were somewhat sensitive on palpation; the right ovary was slightly increased in size. The patient was advised to discontinue treatment, and not to seek further advice. She was next seen in consultation on February 4, when the attending physician said that soon after the patient had been examined by me, pain was felt in the ovarian regions, more particularly on the right side. She had had in the interval an attack of

peritonitis, with a temperature of 105° F. In view of the fact that no instrument, not even a speculum, had been used in the examination of the patient, it seemed most reasonable to ascribe the pelvic inflammation to intrauterine electrical treatment that the woman had received prior to seeking my advice; or perhaps to an infection, the husband having had gonorrhea several years before marriage. On February 18 she was again seen; she in the interval having also been seen in consultation by two other well-known gynecologists. The diagnosis of pelvic abscess was made, which coincided with the diagnosis that had been made by my confrères. On February 20 a vaginal section was made; after evacuation of the pus the customary treatment for pelvic abscesses was followed. The patient's temperature did not subside at any time. Examination about March 25 showed the presence of a swelling on the left side of the uterus; this was thought to be an abscess. On March 30 it was opened; instead of pus, serum was found, but the dilatation of the old cavity showed an accumulation of pus quite high up in the pelvis, and it seemed to me that I could feel the right Fallopian tube into which I thought I had torn a rent. While the patient seemed to convalesce, yet pus did not cease to be secreted from the abscess cavity, for the better approach to which, the opening in the vaginal vault had twice been dilated. The temperature had been normal for three weeks, yet it was incomprehensible to me why the pus did not cease being secreted.

When examining the interior of the old cavity, at the time of the last vaginal vault incision dilatation about two weeks ago, a jagged piece of thick tissue was felt, which was removed and sent to Dr. Henry Brooks the director of the Post-graduate Hospital laboratory. The report was that it was typical tuberculous tissue, probably a part of the abscess wall.

While the possibility of a tubercular condition was momentarily thought of, because of the non-cessation of pus secretion, yet the thought was again dismissed. On the strength of Dr. Brooks' report, and the unfavorable local condition, it was decided to open the abdomen and to act according to circumstances, particularly to remove the cause for pus secretion. It is needless to dwell upon the technical difficulties encountered; the specimen, consisting of the uterus and the adnexa en masse, tells the story. The upper part of the abdominal cavity seemed free, at least macroscopically, from tubercular invasion. It seems that the condition is one of ascending tuberculosis the process beginning in the ovaries or tubes. Whether the tuberculous infection started in the uterus, and if so, how it came into it, is a question.

DR. GUSTAV SELIGMAN reported a case of

HYSTERECTOMY AND EXTIRPATION OF THROMBOSED VEINS IN SEPSIS FOLLOWING ABORTION.

and presented the specimen. The patient had had an abortion performed by a woman prior to her admission to the hospital,

April 14. There was no question about an incomplete abortion having been performed. On the day following her admission the house surgeon completely emptied the uterus and the temperature then dropped to the normal. For three days the temperature was subnormal. She had, however, a bad pulse and she was very anemic. She appeared to be in a state of collapse. On the fourth or fifth day the temperature jumped to 103.5° F.; on the next day she had a chill and the temperature was 104. The general impression was that this was a case that was going to break down. A blood culture was taken but proved negative. On April 23 he succeeded in finding a distinct doughy mass corresponding to the right broad ligament; the left broad ligament was free. He made a diagnosis of thrombosis of the uterine plexus on the right side and decided to interfere. The abdomen was opened, and the diagnosis was found to be correct. The thrombosis extended beyond the internal iliac into the common iliac. The infected province was extirpated and without much difficulty. The woman made a good recovery. The point he wished to bring out in the report of his case and the presentation of the specimen was, when should one interfere surgically in these cases. Every localized infection should be attacked surgically.

ECLAMPSIA AND ITS TREATMENT WITH CONTINUOUS SUGAR INSTILLATION.

DR. SIDNEY D. JACOBSON read this paper. (See journal for June.)

OPERATIONS IN VAGINAL DELIVERY.

DR. EDWARD P. DAVIS of Philadelphia read this paper. (See page 401.)

DISCUSSION.

DR. EDWIN B. CRAGIN said that what had impressed him more than anything else was the preparation that was required of obstetricians to do obstetric work as recommended by Dr. Davis. It seemed to him that they must all recognize that the work recommended by Dr. Davis was the work of an expert and not of the general practitioner. Emphasis should be placed upon the requirements for doing expert obstetrics. Certainly the kind of work described by Dr. Davis was surgical obstetrics, and this meant that the man must have a long course of training. This brought up the question of the immediate repair of the cervix by the general practitioner. Dr. Cragin said that his experience had taught him to believe that, while an immediate repair might be the proper thing to do in the hospital with proper facilities, it was not a good procedure for the general practitioner. He taught his students that, except when there was a hemorrhage, it was wiser not to attempt an immediate

repair of a lacerated cervix; the condition of the woman would be made much safer if the practitioner kept his hands out of the vagina in such cases. As a general rule, unless there was hemorrhage present, leave the cervix and vagina untouched.

With regard to the use of the douche, his experience had led him to omit the antepartum douching, as well as postpartum, except when there was hemorrhage present.

DR. ROBERT L. DICKINSON believed that too much emphasis could not be placed upon Dr. Davis' statement. The more serious cases must go to the hospital for care; these cases should be gotten not only out of apartments and hotels, but out of the homes. They must clearly differentiate those cases, or that class of cases, that can be treated by the general practitioner in dark rooms, with no adequate help, from another class that should be treated in a well-equipped operating-room. The general practitioner cannot with impunity tampon the uterus. Dr. Dickinson was very much interested in what was stated in regard to the immediate repair of the lacerated cervix; this had been warmly advocated earlier, but now it was not advocated except in cases of hemorrhage; if there was much bleeding from a vagina or cervical tear, the tear then should be repaired immediately. In cases, however, when there was no hemorrhage, the edema present made the parts appear so that the operator could not tell whether there was a real tear or an abraded raw surface. The best time to attempt such repairs was four, five, or eight days after labor; then the anatomy of the parts could be readily made out. He objected to leaving in a tampon longer than eight or twelve hours. The danger from defective drainage was great. Dr. Dickinson called attention to the fact that people should not expect to receive the services of an expert obstetrician unless the expert was given proper pay.

DR. JAMES CLIFTON EDGAR thought that the point of the paper and the discussion hinged on the subject of the preservation of asepsis. He said he was practically in accord with all that Dr. Davis had stated. He confessed to being shy at making an immediate repair of the cervix as a teaching proposition. The tendency now was not to attempt it except when there were positive indications. He never left gauze in the uterus longer than twenty-four hours. As a rule, if the gauze was introduced at 4 P. M. it was removed the following morning. He said he was in accord with Dr. Davis' statement about the employment of gauze as a prophylactic, especially in cases of placenta previa; after such cases he packed the uterus as a matter of routine; this was a prophylactic against postpartum hemorrhage.

DR. HERMAN J. BOLDT said he would limit his part of the discussion to the repair of the cervix. He was glad that Dr. Dickinson had abandoned his former routine procedure, one that he once advocated. This was in a paper published in 1888. It was certainly a great omission on the part of a physician to allow

a woman who had been confined to go without a subsequent examination to learn whether and to what extent an injury had been done during delivery. Where there was an extensive laceration of the cervix it should be repaired one or two weeks after its occurrence.

DR. DAVIS closed the discussion.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of April 1, 1910.

The President, DR. KELLEY, in the Chair.

DR. GRASTY read the paper of the evening on

INFANTILE SCURVY.*

DISCUSSION.

DR. PRENTISS opened the discussion emphasizing the importance of the diagnosis from rickets and other diseases, and reported a case seen in his own practice in which the diagnosis had been made only late in the disease. He considered the cause to be an insufficient quantity of breast or cow's milk in natural condition. The high temperatures required for the sterilization of milk destroyed the proteids in the milk and gave the same effect in this regard as absence of milk.

DR. ADAMS said that there was no disease in infancy where the diagnosis was missed so often as scurvy. It was called most frequently a spinal cord disease. The article by Northrup in this country called attention to the condition. The cause of the disease was largely one of feeding, especially with the proprietary infant foods. These foods were not mentioned by name in the literature on account of the lawsuits that were liable to follow. Most cases of scurvy were from the malted foods. Sterilized milk had the same effect in producing scurvy, and why the German babies that were brought up on boiled milk did not have scurvy was an interesting but unsettled question. Properly pasteurized food did not cause scurvy. Hemorrhages into the mucous membranes and the loss of use of limbs led to the popular classification of the condition as rheumatism.

DR. ACKER thought that scurvy was produced by some change in the milk, but that the temperature to which the milk had been raised was not the only factor; personal susceptibility must also be considered. He had seen one case where the milk was not

*See original article, page 552.

known to have been heated at all. On the other hand, in Europe more boiled milk was used, but there was less scurvy.

DR. COOK did not consider the pasteurization of the milk as the cause of the trouble, but rather the absence of certain elements in the diet, and asked if the scurvy would not disappear if fruit-juice was added to the diet and the same milk conditions retained.

DR. COPELAND said that the differentiation of scurvy from rickets was not difficult, although the two were frequently confused. In the description of the condition Barlow had preceded Northrup. Many of the cases appeared in the latter half of the first year of life and he regularly gave orange-juice at that period. Pyelitis was said to be a frequent complication of scurvy and the cause of fever. The subperiosteal hemorrhages might be shown in skiagraphs and aid in the diagnosis.

DR. WALL noted the pressing need of papers on the unrecognized disease. He considered the popularity of pasteurization as having its serious side, but preferred to give pasteurized milk to the infants rather than bad milk. In addition to the pasteurized milk antiscorbutics could be given. A possible explanation of the difference in the effect of heated milk in Europe from that in America might lie in the presence of inorganic salts of different natures in the milk produced by the cows of the two countries.

DR. FRY said that twenty-two years ago he had seen his first case of scurvy that had been called first rheumatism then hip-joint disease. The child had been fed on artificial food. He found the condition most common in children coming back from the country.

DR. DONNALLY said that he had found enteritis a common complication of scurvy, there being a diarrhea with mucus. Orange-juice and barley water taken steadily for six weeks cured the enteritis.

DR. ACKER thought that the medical profession should insist upon the production of clean milk. The milk that needed pasteurization at the farm and again at the dairy was always bad and unfit for use. Home sterilization of milk was satisfactory.

Meeting of April 15, 1910.

The President, DR. KELLEY, in the Chair.

DR. I. S. STONE presented a specimen of

SARCOMA OF THE UTERUS AND RIGHT OVARY: PANHYSTERECTOMY.

Miss P. H., white, aged forty-two years, had been in rather poor health for a year. She had lost from 15 to 20 pounds in weight and was pale and weak from uterine hemorrhage which had finally driven her to see a physician. She had been unable to attend to her office work for several months, but had not become alarmed at her condition until early in February

last. When the examination was made by the family physician whose name I did not learn, he pronounced the disease a sessile growth within the uterus, not a bad diagnosis by any means. The tumor appeared to be the usual uterine fibroid with an additional pedunculated fibroid attached near the right uterine cornu. The operation was performed at Columbia Hospital in March. A very radical operation was necessary because we soon found that we were mistaken in the nature of the growth and had every reason to think the disease malignant. The most extensive dissection was done consistent with fairly safe operation. The uterus, appendages, portions of the right broad ligament, and the adjoining peritoneum were removed and the subperitoneal spaces searched for glandular involvement, fortunately without finding actual visual evidence of metastasis. The patient recovered nicely and without fever.

DR. BOVEE called attention to the dread of the patient for operation and the laxity of the physician who said that bleeding at the menopause was normal change of life as the causes of many late operations. In the wide dissections for malignant growths the recognition of injury to the ureter was important. In 1898 he had begun ureteral examination by placing a loop of catgut under the ureter at the crest of the ilium and traction on that indicated the course of the ureter when desired. In one case he had done a resection of the ureter for involvement with cancer and had implanted the end of the ureter in the bladder. Later investigation showed that while the glands surrounding the ureter had been involved by the growth the tissues of the ureter itself were not invaded, and the resection could have been avoided.

DR. STONE said that the patient was now on Coley's serum. Of his sarcoma cases associated with fibroids one operated on in 1893 was still living. That was an intrauterine fibroid that had broken down. Two other cases were both living after a shorter period. He thought the prognosis after sarcoma was better than after carcinoma.

DR. JOHNSON read the essay of the evening on

FIBROIDS IN PREGNANCY.

DISCUSSION.

DR. MORAN, in opening the discussion, noted that 80 per cent. of sarcomata of the uterus occurred in women under thirty years. The pain was due to tension and increased vascularity of the tumor, and the diagnosis was suggested by the irregular bleedings at or between periods. The complications that arose during pregnancy were pain, hemorrhage, abortion, sloughing of the fibroid, necrosis, torsion of the pedicle of the subserous fibroids, placenta previa, and incarceration of the uterus in the pelvis. During labor there arose hemorrhage either ante-,

intra-, or postpartum, malpositions of the fetus in 50 per cent. of the cases, and rupture of the uterus from degeneration of the uterine tissue, especially in the upper segment.

During the puerperium there arose hemorrhage, infection, phlebitis, adhesions of the placenta, and retention of the lochia. Some of the cases of simple fibroids simulated pregnancy with all the breast signs and softening of the cervix. In the subserous variety there might be ballottement and bruit might be simulated. The only sure signs were the hearing of the heart sounds and the Braxton Hick's sign. The subperitoneal fibroids were the least dangerous and the submucous the most dangerous from the chance of infection, hemorrhage, or rupture of the uterus. The treatment should be conservative in the many cases that needed only watching and perhaps repositors with the patient in the knee-chest posture during labor. The danger after labor of hemorrhage and infection should always be guarded against most cautiously. Personally he had had six cases. One with multiple interstitial and submucous fibroids and a heart lesion had died two hours after labor. There was bloody fluid in the abdomen and the heart was dilated and degenerated. The second case had a fibroid of the cornu and had been normal. The third case had had multiple interstitial fibroids and went through two pregnancies without trouble. The fourth had an ovarian cyst and some small fibroids, and she also was uneventful in her pregnancy. A myomectomy preceded a later pregnancy. In the fifth case of submucous fibroid in the anterior wall labor was followed by hemorrhage, infection, phlebitis, and disappearance of the fibroid. The sixth case had multiple fibroids, and so far was uneventful.

DR. STONE called attention to the occasional disappearance of fibroids after labor. Bland Sutton reported a case of infection postpartum with rupture of the capsule of a submucous fibroid and a partial sloughing out of the fibroid. He knew of one case where there was a submucous fibroid in the wife of a physician. She had gone through three pregnancies.

DR. SPRIGG had had six cases, two had aborted, one at six weeks and one at five and a half months. The other four went to term without complication. In three the fibroids had grown much smaller and almost disappeared.

DR. JOHNSON, in closing, called attention to the intolerable pain that at times demanded hysterectomy or myomectomy during pregnancy.

REVIEWS.

AMERICAN PRACTICE OF SURGERY. A Complete System of the Science and Art of Surgery, by Representative Surgeons of the United States and Canada. Edited by JOSEPH D. BRYANT, M. D., LL.D., and ALBERT H. BUCK, M.D., of New York City. Complete in eight volumes. Profusely illustrated. Volume VII. New York: Wm. Wood & Co. 1910.

This volume continues the discussion of regional surgery, opening with a chapter on Surgical Diseases and Wounds of the Pelvic and Gluteal Regions, by Charles H. Peck, of New York. Then come chapters on Surgical Diseases of the Extremities, by Charles A. Porter and William C. Quimby, of Boston; Surgical Diseases and Wounds of the Abdominal Wall, by J. D. Griffith, of Kansas City; Diagnosis of Tumors of the Abdomen, by Malcolm La Salle Harris, of Chicago; Abdominal Section, by William McDowell Mastin, of Mobile; Surgery of the Pericardium, Heart and Blood-vessels, by Robert G. LeConte and Francis T. Stewart, of Philadelphia; Surgical Diseases and Wounds of the Stomach and Esophagus, by Albert J. Ochsner, of Chicago; Surgical Diseases of the Diaphragm and Subphrenic Abscess, by J. Charles Reeve, of Dayton; Surgical Treatment of General Septic Peritonitis, by the late Andrew J. McCosh, of New York; Tuberculous Peritonitis, by Nathan Jacobson, of Syracuse; Abdominal Hernia, by E. Wyllys Andrews, of Chicago; Inflammatory and Other Diseases of the Vermiform Appendix, by McCosh; Surgical Diseases and Wounds of the Intestine, Charles W. Oviatt, of Oshkosh; and Surgical Disease and Wounds of the Anus and Rectum, by James P. Tuttle, of New York, and Samuel T. Earle, of Baltimore.

LEHRBUCH DER GYNAEKOLOGISCHEN CYSTOSKOPIA MND URETHROSKOPIE. Von PROF. W. HOECKEL, Director der Universitäts-Frauenklinik in Marburg, a.L. Zweite, völlig neubearbeitete Auflage der "Cystoskopie des Gynäkologen." Mit 25 lithographierten Tafeln und 107 Textfiguren. Berlin, 1910: Verlag von August Hirschwald, N. W. Unter den Linden, 68. Price, 16 marks.

To call this book a mere second edition of his previous "Gynecological Cystoscopy" is an injustice. It is to all intents and purposes a new book. The majority of the chapters have been entirely rewritten, while a number of others have been added. The number of plates and illustrations have been increased. The volume, as a whole, is decidedly more massive than its predecessor.

Hoeckel is rather eclectic in his tastes, and while he prefers the old-fashioned Nitze cystoscope, he describes the forms and methods of using of nearly all its modifications. It will be seen,

therefore, that from this point of view, as well as from others, the work is very thorough. The preliminary chapters deal with the construction of cystoscopes, the armamentarium necessary for their use, asepsis, anesthesia, and preparation. The author then devotes a long and detailed chapter upon the conduct of a normal cystoscopic examination: examination both in the air-containing and water-containing bladder are included. After discussing briefly the complications and the indications for cystoscopy, Hoeckel proceeds to a description of ureteral catheterization. This chapter is also set forth in considerable detail. The dangers of both cystoscopy and ureteral catheterizations are emphasized. The second part of the work is more pathological and is concerned with the description of all pathological states of the female bladder. Especially noteworthy and interesting are the cystoscopic appearances of the bladder during pregnancy, and after various gynecological operations which may affect the position and contour of the bladder. Urethroscopy is discussed rather cursorily. The book concludes with a chapter on cystoscopic and urethroscopic therapy.

The volume reveals qualities of authorship of a high order. As director of a large university clinic, he is in command of abundant material. In his long association as instructor of cystoscopy, he has gained a valuable insight in to the point of view and requirements of students. In fact, the one distinctive feature of the author's exposition is the manner in which he anticipates and explains just those difficulties which are liable to beset the beginner. The text is clear and sufficiently precise to enable the less experienced to perform cystoscopy and recognize lesions with little difficulty. The illustrations and especially the plates are splendidly executed.

We know of no book in which cystoscopy of the female is as well and comprehensively discussed as in this volume. E. M.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Operative Treatment of Placenta Previa.—Max Henkel (*Arch. f. Gyn.*, 1910, Bd. 90, H. 3) says that the prognosis of placenta previa is not as good in private practice as it has become in hospital work. The abdominal Cesarean section has not found such favor in this complication as was hoped by some operators. The method of dilatation and plugging with the rubber balloon does not give such good results that it should be used in all cases. All the different methods have their application in some cases, and the last word has been said when we advocate that whenever possible, a case of placenta previa should be taken to a hospital as

early as possible after diagnosis has been made. The danger in placenta previa increases with the advanced period of pregnancy; the later it is diagnosed, the greater is the danger of hemorrhage. The small uterus of early pregnancy is much easier to empty than during the last two months of pregnancy. A Cesarean section made after the cervix is dilated will be of little benefit, because the strong contractions of the much stretched lower uterine segment makes it impossible for any good effect to be obtained. The use of the balloon in the vagina is of little value and only when there is not placenta previa centralis, but when the placenta is located deeply. Introduction of the balloon after the rupture of the membranes is not altogether harmless. In version the leg which has been brought down does not yield an easy hold when extraction is desired. Children can be born alive only when the pregnancy is near its end. If we trust too far to a spontaneous delivery in this case death by bleeding may occur, and even after delivery the placenta may continue to bleed. The arms may obstruct delivery and reduction will be exceedingly difficult while bleeding is going on. The author believes that we need some more active method than the version and extraction of Braxton Hicks. There is danger of tearing of the cervix during the manipulations necessary to extraction. The cases should be more individualized than they have been, and not all treated by the same method. The life of the mother should always be preferred to that of the child. There are a number of cases that must end fatally without a Cesarean section. We should make a sharp distinction between placenta previa centralis and lateralis in our therapeutics. In the cases of dead children we should seek to decrease the size of the ovum by crushing the head. If infection has already occurred the Cesarean operation is contraindicated. The size of the child is of importance in the consideration of the method of delivery. The exsanguinated woman withstands infection badly and the use of the tampon exposes to the danger of infection. The question in section is which method of opening the uterus is the best. The cervical section is not possible because of the size and hardness of the child's head. The incision of the uterus, both in front and behind, exposes the patient to increased danger from hemorrhage, since an incision may be increased in length during delivery by tearing through the culdesac of Douglas, and even into the peritoneal cavity. Only incision of the anterior wall is possible. The wall of the uterus should be clamped with two forceps above and below the site of incision in order to get an almost bloodless extraction. Version with premature children has not been used by the author recently. He prefers, under the control of the fingers and the eyes, after detachment of the placenta, to grasp the skull with clamps and extract. When pregnancy is at term he makes use of the abdominal Cesarean section, opening the uterine wall in the center. The incision should lie outside the peritoneum. In the klinik at Greifswald the author has seen

since 1894, eighty-four cases of placenta previa out of 3,882 births. Metreuryxis was used in thirty cases under Martin, with six deaths, two from puerperal fever, the others from hemorrhage. Fifteen children died. From November, 1897, twenty-six cases have been treated by the author with two deaths, one from hemorrhage and one from pyemia. In central placenta previa section is demanded in all cases, the abdominal cervical should be done if the child is not viable. In premature births the vaginal Cesarean section and emptying of the uterus without version, by perforation and cranioclasty, are preferable. With prophylactic clamping of both uterine arteries the extraction will be bloodless. In lateral placenta previa the balloon and version may be used.

Greater Frequency of Still-births and Deaths under a Year in Males than Females.—A. S. Dutton (*Med. Press*, May 4, 1910) states that in Guy's Hospital Lying-in Charity, out of 47,000 deliveries, including all presentations, 42.8 per 1,000 males and 35.6 per 1,000 females were still-born; and in vertex presentations at full term the still-born children numbered 26.9 per 1,000 in males and 21.5 per 1,000 among females. Of the various causes of still-birth, there appear to be none, with the exception of a disproportion between the fetal head and the maternal pelvis, which affect males in any noteworthy number of instances more than females, the heads of newly-born male infants having an average excess in circumference over females of about half an inch. As to deficiencies in the pelvis of many women of the present day, while rickets no doubt largely accounts for those of a more serious nature, the great majority of them are of the infantile type, which the writer believes results from imperfect nutrition *in utero* and anemia in the developing child. The birth of males, owing to the larger size of the head, is likely to occur at an earlier period in pregnancy than in the case of females. The further removed the birth is from the full period of intrauterine life, the more risk is there of death in infancy in consequence of the lack in normal vitality, and thus also of resisting power to the effects of various diseases, and this will, I think, mainly account for the greater proportion of deaths from premature birth among the male than in the female sex during the first year, and especially during the first few days and months of life. The writer holds that the solution of the difficulty lies in improving the physique of women.

Treatment of Placenta Previa.—E. Hauch (*Monat. f. Geburts. u. Gyn.*, May, 1910) discusses the indications for treatment of placenta previa. His conclusion, given as a result of the births at the Hospital for Women in Copenhagen, is that the best method of treatment is dilatation and compression by the use of the inflated rubber balloon. This is the best method in the interest of the child, although there is some danger of infection. The difficulty of the use of the balloon is that on account of the apparatus needed it cannot easily be placed in a private house, and must remain a hospital operation. Delivery by version and

extraction after the method of Braxton-Hicks is the next best method, and this is applicable in a private house. The use of Cesarean section is not considered proper in placenta previa by the author. The conclusions are based on 240 cases of placenta previa. Twenty-four arrived at the hospital without having bled and with undilated cervix; seven were total placenta previa, with one death, from bleeding for a day before entering the hospital; seventeen were partial placenta previa, with one death from anemia and ruptured cervix. Rupture of the membranes is useful in slight cases only. Thirteen cases were delivered thus. Eighteen deliveries were made by combined version and extraction with no deaths. By balloons 144 cases were treated, with sixteen deaths; sixty were total, eighty-four, partial. In 103 cases, after the balloon was used, version and extraction took place. The danger of infection is greater in extraovular than in intraovular introduction of the balloon.

Treatment of Labor in Contracted Pelves.—G. F. Blacke (*Lancet*, Mar. 19, 1910) states that in any case in which it is considered inadvisable to perform Cesarean section, or in which this operation is rejected by the patient, and in which the induction of premature labor has been followed by the birth of a still-born child on one or more occasions, the patient may be allowed to go to full term, and, if necessary, pubiotomy may then be performed. An additional advantage of this plan of treatment would be that in many cases the necessity for pubiotomy would not arise, since spontaneous delivery might occur. Although in the average pregnant woman the operation of Cesarean section is an easy and safe one, yet pregnancy does not occur from time to time in women in whom any abdominal section would be an extremely dangerous operation, and such a patient might, if it were necessary, prefer pubiotomy to the destruction of her living child. If the patient is in labor when seen and the head fails to engage or is arrested at the brim, then, if moderate traction with high forceps fails, in place of the forcible delivery with the forceps of the head through the brim (an operation which entails a fetal mortality of at least 40 per cent.) or the performance of version (which entails even a higher fetal mortality) Cesarean section should be performed; while if the case is considered unsuitable for the performance of late Cesarean section, then pubiotomy certainly may be substituted for craniotomy of the living child. Pubiotomy should, however, only be practised if it is certain that the child's life has not been in any way imperilled, and in view of the serious complications which may follow, it is not an operation suitable for private practice, and should only be performed in such surroundings as obtain in a hospital.

Hemorrhage from Varices in Pregnancy.—Robert Cristofolletti (*Gyn. Rund. J.*, iv, H. 7, 1910) says that although varices of the vulva and external genitals are common they are not generally supposed to be dangerous. He gives the histories of two cases

observed by him in which the bleeding was severe, and operative interference was necessary to stop the hemorrhage. The theory that these varices are caused by pressure of the gravid uterus is not generally accepted at the present day. Another theory of the causation is that it is due to an increased arterial pressure. It has been observed that after the death in utero of the fetus the varices decrease in size; also that they do not occur with large abdominal tumors which exercise the same amount of pressure. It has also been stated that there is an increase in the walls of the vessels, such as is seen in many of the other organs. Fischer thinks that the beginning of the varices is an inflammation of the walls with diminution of the elasticity of the wall which causes the increased pressure to be felt abnormally by the vessels. Falk considers it as due to an intoxication from the excretory poisons of the fetus. Were this the case we should have varicosities more often in primiparæ, while they are found more frequently in multiparæ, on the contrary. Tarnier injected into a varix, postmortem, a solution of blue and found that it entered the iliac vein. A considerable number of cases have been reported in medical literature among which the percentage of deaths from hemorrhage is large. Of eighteen cases reported by Budin sixteen ended fatally. From the records of the hospital at Vienna the author found that among 50,000 births, twelve cases of severe hemorrhage from varices of the vagina and vulva were noted; in four cases the hemorrhage began during pregnancy and was treated by ligature after encircling the vessel with a curved needle. One of these died of an infected phlegmon. Another had hemorrhage from the cervix, which was treated by ligation, but an application of acupuncture forceps became necessary. The symptoms are so slight that they are not noted by the patient when the varix is in the vagina, there being only a slight burning and weight. When any injury occurs, bleeding may at once become severe. Thrombi may form in the varices, which may then become infected. They look like blue, shining knots in the veins. The differential diagnosis between varices and chorioepithelioma is difficult when bleeding has not yet occurred. When it has begun it is seen that in chorioepithelioma there is a small ulceration of one of the projections of the tumor, which has come from necrosis of an embolism on the surface. The walls are characteristically sharply defined. A varix may show ulcerations, but they are irregular and the walls are not sharply defined. When bleeding has occurred in pregnancy, we must stop it by ligation, and place the patient in bed and keep her as quiet as possible. When it becomes necessary to tampon the vagina there is great risk of sepsis, as it may be necessary to leave the tampon in place some days. In such cases we must think of the possibility of hastening labor and immediate emptying of the uterus. Some authors believe that it is justifiable to perform a Cesarean section in severe cases.

Value of Cultures Made from the Blood in Puerperal Infection.—V. Cathala and Paul Gueniot (*L'Obstét.*, May, 1910) have made

a study of the possibility of obtaining assistance in the prognosis of puerperal infection by cultural examinations of the blood. They wished to find out how frequently germs were to be found in the blood in puerperal fever. They cultivated the blood of thirty-eight patients who had puerperal fevers of varying degrees. Four cases had to be eliminated because the fever was not due to infection. Of the remaining thirty-four, eleven died. In twenty cases the culture media remained sterile; in seven, a pure culture of the streptococcus was found; in two, of the staphylococcus; in two of micrococcus tetragenus; in one, of bacillus coli; and in one of micrococcus tetragenus and staphylococcus. The negative results might have been due to unsuitable culture media, small amount of blood used, or taking the blood at the wrong time. They conclude that the use of cultures is not a reliable method of obtaining a prognosis in puerperal infection. Still this method is of value in combination with others. The method of Arneth-Wolff, dependent on the number and form of the polynuclear neutrophiles present in the blood, is of some value. The streptococcus is often found in the blood of patients who have recovered from puerperal septicemia. On the other hand, cultures may remain sterile even when there is true infection. Blood taken at the time of a chill is often sterile. The prognosis of puerperal infection must be deduced from several factors.

Prefetal Vaginal Dilatation in Breech Presentation.—C. Sauvage (*Ann. de gyn. et d'obstet.*, May, 1910) says that the indications for the use of the balloon of Champetier de Ribes depends upon its action as a tampon and a dilator after its introduction into the uterus. The author believes that it has also an indication for use in dilatation of the vagina in breech presentations. In these cases the life of the child is often lost, on account of delay in delivery, from compression of the cord. Instead of letting the air out of the balloon after it has escaped from the uterus, it may be left inflated and be allowed to be expelled from the vagina, or it may be drawn out of the vagina by its inlet tube. Pinard has used the balloon for this purpose for some years. Since the beginning of the year 1908, he has placed an incompressible balloon in the vagina of every primipara that has been confined at the Baudelocque, which has had a breech presentation. The filling of the balloon is painful. Its action in the vagina accelerates the labor by increasing the pains. This procedure shortens labor materially. It prepares for a spontaneous labor, and reduces the indications for extraction by the breech. Fifty cases have been treated in this way at the Baudelocque for breech presentation; eleven multipara and thirty-nine primiparae. This method has no dangers for the mother, and it makes the prognosis for the child in breech presentations far better. It lessens fetal mortality one quarter, makes the child stronger after delivery, and lessens the number of birth injuries in breech cases. The balloon should be introduced when the cervix is dilated to the size of a five-franc piece.

Rupture of the Uterus.—C. M. Green (*Bost. Méd. Surg. Jour.*, 1910, clxii, 669) reports a case of spontaneous complete rupture of the uterus in labor at term, treated by laparotomy and uterine suture, with subsequent full-term normal labor. The rupture occurred only seven and one-half hours after the beginning of the patient's ninth labor.

Glycosuria in Pregnancy.—P. Rudaux (*Med. moderne*, May, 1910) says that the urine in all cases of pregnancy should be examined for the presence of sugar. Especially when a woman complains of pruritus vulvæ is it necessary to search for sugar. The glycosuria of pregnancy is lessened by an appropriate diet, but does not disappear until pregnancy terminates. It always ceases with the termination of pregnancy, but frequently returns with each succeeding pregnancy. It sometimes causes premature labor. The sugar appears more frequently in multiparæ, and in those who have previously nursed their children. The author has examined for sugar the urine of a large number of women, and sums up his results. Five cases were of particular interest, since examinations were begun in the early months of pregnancy, and continued until labor occurred. In four of them sugar was found in the first pregnancy; in two the sugar was present in the second pregnancy also. It was always found in the early months of pregnancy. In one it was discovered before the first missed period; the patient had pruritus vulvæ. The sugar was never found except during pregnancy, although the urine was frequently examined in the interval. The quantity varied from 5 to 35 grams a day. It ceased as soon as labor had taken place. The glycosuria was always the only symptom.

Treatment of Peritoneal Inundation from Rupture of Extra-uterine Pregnancy.—Cyrille Jeannin (*Gaz. de gyn.*, May, 1910) says that in case of a ruptured extrauterine pregnancy it is necessary to intervene at once; there is no time to remove the patient to a hospital or to call on a consultant. In the meantime the patient may bleed to death. He gives the method of procedure in such a case in detail. The first thing is to fortify the patient by subcutaneous injections of artificial serum or by hypodermics of heart stimulants. The instruments may be the simplest: one bistoury, a pair of right-handed scissors, a dozen artery forceps, a short Reverdin needle, one pair of mouse-tooth forceps. The materials for compresses consist of sterilized gauze and two rubber drains. The abdominal wall is disinfected with ether brushed with 90 per cent. alcohol, and then disinfected with iodine on a sterilized swab. Ether is used as an anesthetic. The whole abdomen is covered with sterilized towels, except the field of operation. The operator is placed at the right of the patient, his assistant opposite him. The abdominal incision is median, extending from the pubis to two or three fingers' breadths above the umbilicus. The section of the fatty layer and the first layer of fascia is made rapidly; the second layer of fat is divided and the peritoneum seized with forceps and a small

incision made. A compression forceps is placed at each end of the peritoneal wound and the serous membrane is gradually incised to the same extent as the skin. It is necessary to see well and to maneuver easily; an increase of two or three centimeters in the length of incision will not cause more shock. The right hand is immediately plunged into the abdomen and the uterus seized and drawn into the incision: this brings the ruptured tube into view. Two clamps are placed, one on each side of the rupture in the tube, to arrest the hemorrhage, and the rest of the operation can be done with less haste. With a large compress the remainder of the blood is sponged out, the clots are turned out with both hands, and the vascular pedicles are ligated and the tube cut away. The pedicles are ligated with strong catgut doubled. Sponging is again made use of, and the vessels are examined to see if all the hemorrhage is checked. The ends of the cut tube are touched with the galvanocautery, the ends of the tube are closed with small catgut. All blood is removed and the abdomen is closed in two planes. Drainage is not needed unless there is reason to believe that the abdomen has not been thoroughly emptied. This operation is simple and its success depends on the rapidity of its execution.

Dystocia Due to Hydatid Cysts of the Pelvis.—Lafond (*Jour. de méd. de Bordeaux*, June 12, 1910) gives the history of an interesting case of hydatid cysts of the pelvis, complicating pregnancy, in which the cysts were an obstacle to delivery. This case with thirty-seven collected by Franka are all that have been reported. The patient had an uninterrupted fifth pregnancy, and no bad symptoms until labor had begun, when it was seen that there was some obstacles to the descent of the head. Examination after the patient had been brought to the hospital showed that there was a round, elastic tumor occupying the whole of the vagina, so that the finger could reach up only a short distance on one side. This tumor disappeared shortly afterward, and labor went on until the head had descended to the perineum, when the forceps was applied because the pains had ceased. There was then a gush of liquid containing hydatid cysts. After labor it was found that an outer cyst had ruptured and that there was an opening into an inner cyst which contained hydatid hooklets. A third cyst was found still further back, after several days, during which suppuration had set in. When this cyst was opened the suppuration ceased and recovery went on rapidly. The posterior cyst was adherent to the sacrum by a fibrous pedicle.

GYNECOLOGY AND ABDOMINAL SURGERY.

Intramural Cysts of the Uterus.—Three cases of this condition are recorded by E. B. M. Haarbelicher (*Jour. Obst. Gyn. Brit. Emp.*, Mar., 1910) who also reviews the literature. This shows that intramuscular cysts are formed in all parts of the uterus.

They are usually so small that they are only found as objects of pathological interest at a postmortem or in specimens removed by operation, but apparently they may reach a considerable size and attract clinical attention (e.g., size of a nine months' pregnancy, Rosenthal). The epithelium may be well-defined, ciliated or nonciliated columnar cells or represented merely by a smooth internal lining, or not demonstrable at all. They may contain pavement epithelium. These cysts may have a congenital origin. A sufficient number of cases with full examination have not yet been reported to confirm the many theories of possible origin under this heading. The origin from Gärtner's canal appears to have at present the most cases in support of it. An origin from a congenital inclusion of mucous membrane is strongly supported by one of the writer's cases. These cysts may be acquired. One of the cases recorded appears to be inflammatory in origin. The frequent occurrence of abundant hemorrhage noticed in some cases is probably to be attributed as suggested by Robert Meyer to concomitant vascular lesions (arterio-sclerosis, fatty degeneration, and increased blood pressure). The cysts do not appear to be in any case the only pathological condition present, though in some cases the condition of the appendages is not mentioned. In only one case is a concomitant congenital malformation mentioned. In no case was the character of the cyst diagnosed before operation or death. In two cases the patient's life might have been spared had the condition been recognized directly the abdomen was opened.

After-results of Abdominal Operations.—A. E. Giles (*Jour. Obst. Gyn. Brit. Emp.*, March, 1910) bases his remarks and conclusions upon 1,000 consecutive abdominal operations on the pelvic organs. He says that, speaking generally, operations for the removal of the appendages of one side have no detrimental effect on the general health, the cases where ill health could be traced to the operation numbering not more than 5 per cent. About 90 per cent. of cases were actually better after the operation than they were before. The relief of symptoms is well-marked after these operations; about 87 per cent. of patients were free from pain afterward or experienced less pain than before the operation, whilst a further 5 per cent. were free from pain for a time and developed pain later from other causes. Dyspareunia, dysmenorrhea, menorrhagia, and leucorrhea were relieved in a number of cases. The removal of the appendages of one side was followed by irregularity, diminution or cessation of menstruation in a small number of cases (eight); and in six cases there followed a diminution of the sex instinct. The chances of the disease developing in the remaining ovary and tube are not very great: such a recurrence took place in about 10 per cent. of cases. Consequently, in view of the definite value of the remaining ovary and tube, it is always worth while preserving them when they appear to be healthy. Soiling of the peritoneal cavity with the contents of an ovarian cyst favors

the occurrence of later disease and therefore the interests of the patients are safeguarded by the removal of these cysts (however large) intact, without tapping. The remaining tube and ovary have a considerable value from the point of view of subsequent pregnancy; thirty-three patients, or 25 per cent. of the married women under forty, became pregnant. Of these, nineteen had full-time deliveries (some repeated), five had miscarriages, and seven had extrauterine pregnancy, while two were pregnant when seen. It would appear that after the removal of appendages of one side there is a greater liability to the occurrence of extrauterine pregnancy than is the case with normal women. A study of the sex of these children in relation to the side on which the remaining or active ovary was situated definitely refutes the theory that the right ovaries produce boys and left ovaries produce girls; it shows clearly that there is no relation between the side from which the ovum is derived and the sex of the child.

Treatment of Pelvic Infections with Bacterial Vaccines.—Speaking of the use of vaccines in the treatment of pelvic infection, F. L. Oastler (*N. Y. State Jour. Med.*, May, 1910) says that they do not seem to cure infection, but simply aid in stimulating increased resistance and so combat sepsis, often turning the tide in favor of the patient. They are indicated especially in conditions of poor resistance, as evidenced by a comparatively low leucocyte count with a high polymorphonuclear count. Too much reliance, however, must not be placed on the leucocyte count, for it is very uncertain. The method of administration is by hypodermic injections, given deep into the gluteal region. The dosage is as yet in the stage of experimentation. Formerly it was the custom to give large injections every fourth day. Of late, injections are given daily, but in smaller doses and with apparently more satisfactory results. It would seem that in order to overcome the constant reproduction of bacteria at the site of infection, a constant prodding of the opsonins is necessary, thereby calling for daily injections. At present the writer is giving the following doses of bacterins, all autogenous, he having had no success with "stock" vaccines: *Staphylococcus aureus*, 75,000,000 to 200,000,000; *streptococcus*, 25,000,000 to 100,000,000; *bacillus coli*, 40,000,000 to 75,000,000; *bacillus mucosus capsulatus*, 40,000,000 to 200,000,000; *pneumococcus*, 25,000,000 to 40,000,000; *gonococcus*, 6,000,000 to 40,000,000. Results have been more satisfactory with the *staphylococcus aureus* and the *bacillus coli* and less with the *streptococcus*. Many infections are found to be mixed, in which cases injections of mixed bacteria are given. Attention is called to the very great frequency with which the *bacillus coli* is found in pelvic infections. The treatment of pure *gonococcus* infections with vaccines has been very disappointing, especially in conditions of gonorrheal urethritis. Disagreeable symptoms following injections are uncommon. When they do occur, one injection should

be omitted. The strength of the injection should be gradually increased, depending upon the patient's ability to withstand the possible negative phase.

Postoperative Peritonitis: Prophylactic Use of Bacillus Coli Vaccine and Nucleic Acid.—D. P. D. Wilkie's (*Med. Chron.*, Mar., 1910) experiments were carried out upon rabbits, using bacillus coli communis because in cases of peritonitis following intestinal operations this organism predominates in the peritoneal exudate. The writer says that recovery from such infections depends on the patient's capacity and particularly on the capacity of his peritoneum to react promptly. The presence of a leucocytosis in the blood stream favors a prompt peritoneal reaction. He finds that the preliminary subcutaneous injections of a suitable vaccine and of nucleic acid enhances an animal's powers of reaction to peritoneal infection; and that preliminary treatment with a combination of vaccine and nucleic acid is of much greater value than treatment with either of these agents alone. A vaccine made from a virulent culture is more efficacious than one made from an old stock culture of the same germ. The author has employed this method in sixteen cases of resection of the large intestine, with two deaths. He believes that two-stage operations for the removal of growths of the large intestine have many advantages, among others the fact that owing to the irritation caused by the first operation the peritoneum is in a measure prepared to withstand infection should it occur at the second operation.

Treatment of Diffuse Suppurative Peritonitis by Enteroclysis and Drainage Through the Cecum.—J. E. Allahan (*Jour. Amer. Med. Assn.*, 1910, liv, 939) has adapted Weir's suggestion, that the appendix could be used for irrigating the colon in amebic or mucous colitis, in the treatment of two cases of diffuse suppurative peritonitis, with one death from pyelephlebitis. In both cases the appendix was amputated, a catheter inserted into the cecum and secured by a purse-string suture of the stump and by a retaining suture through the cecal wall. A pint to a pint and a half of salt solution was slowly introduced into the colon every two hours. But each time the solution was introduced the hemostatic forceps that clamped the catheter during the intervals was released and free liquid fecal evacuations were secured through the catheter into the pus basin. By this procedure much gas and bacteria-laden feces were withdrawn from the intestine. It is of especial importance to continue this procedure until free bowel evacuations are secured through the rectum. The possible objections to this procedure are: leakage of physiologic salt solution and feces into the peritoneal cavity; complications from a fixed condition of the cecum; persistent fecal fistula. The advantages claimed by the writer are that large quantities of hot normal salt solution may be rapidly introduced into the circulation, immediately after operation, overcoming shock, quenching thirst, and eliminating toxins. The solution is brought

immediately into contact with that portion of the alimentary canal most favorable for absorption. Intestinal paresis from gas retention is avoided and early normal evacuation of the bowels secured. Early relief of toxemia is secured by drainage through the catheter of bacteria-laden feces. The unpleasant and uncertain features of proctocolysis are eliminated, and pre-digested foods may be administered in definite quantities.

Removal of Collapsed Vulvo-vaginal and Other Cysts and Hernial Sacs.—A. J. Schoenberg (*Surg. Gyn. Obst.*, Mar., 1910) proposes to overcome the difficulty of excising collapsed vulvo-vaginal cysts by packing them with gauze.

Erosions of the Vaginal Portion of the Uterus.—F. L. Adair (*Surg. Gyn. Obst.*, April, 1910) has examined in serial section preparations from the vaginal portion of the cervix in fifty-seven cases, from the new-born to sixty years of age. He finds pregnancy to be a very important factor in the development of erosions because they occur so frequently in that condition. Labor with its attendant injuries gives a splendid chance for infection and the development of an erosion. Inflammation is the most important factor in the origin as well as the extension of the erosion; all other things are accessory. Round-celled infiltration precedes the formation of an erosion, as is proved by the following observations: such infiltration occurs in cases without erosions under the squamous epithelium either superficially or around the glands; infiltration is found under well-preserved epithelium in healing and healed erosions and one sees an apparent recurrence of an erosion beginning at the infiltrated area. Glands are especially susceptible to infection, and the intensity and frequency of the infiltration around their orifices is very striking; but infiltration occurs independently of the glands, so they cannot be regarded as the exclusive source of the infection. Infiltration and necrosis spread out under the old squamous epithelium, and such epithelium when it is undermined by this infiltration dies and is cast off. The basal layer of the squamous epithelium appears to be the first of the epithelial layers to die as a result of the underlying inflammation. This points quite definitely to a cause working under the epithelium. Hemorrhages under the epithelium are often associated with the inflammatory process, and this raises it from its supporting tissue and helps in throwing it off. There are two distinct kinds of columnar epithelium which may occur on the surface: the basal columnar epithelium and the real or cervical type of epithelium. The newly formed squamous epithelium extends outward from the margins of the erosion over the denuded surface. Cysts arise from the shutting off of out-growing glands or from a stopping of their openings with squamous epithelium. Limited observation of the form of erosions which is called the "erosio papillaris" points to their origin and development from a hyper-regeneration primarily of the connective tissue. Healing is accomplished by the growth of granulation tissue. Irrespective

of its type, epithelium has a tendency to cover over a denuded surface and it is because of this power that we find the erosion covered with the most accessible form of epithelium. This would very frequently be columnar epithelium because of the nearness of the glands and the cervical mucosa to erosions which are most commonly found near the external os. Cylindrical epithelium has the power of growing more rapidly than the squamous epithelium; but the squamous epithelium has greater powers of resistance, and growth though slower is more persistent. In this way the surface ultimately becomes covered with the squamous cells. The glands disappear in various ways, and first may be mentioned the necrosis which occurs during the inflammatory process. The growing in of the squamous cells and destruction of the glandular cells is proved by the frequent occurrence of newly formed squamous cells under the cylindrical cells at the mouth of the glands, also by the occurrence of older glands with columnar epithelium on only one side, while the rest of the lumen is almost completely filled with squamous cells. One sees solid plugs of squamous epithelium which show more or less intact communications with the surface, and the occurrence of the squamous epithelial cysts is not at all infrequent.

Proptosis of the Left Broad Ligament as a Cause of Chronic Constipation.—W. E. Miles (*Chic. Med. Rec.*, April, 1910) has observed in cases of chronic constipation associated with pain in the right iliac fossa that the inlet to the pelvic cavity was considerably obstructed by the left broad ligament having assumed a horizontal instead of a vertical position and thus forming a distinct shelf; that the proximal portion of the pelvic colon rested upon this shelf; and that the remainder of that portion of the bowel, in order to pass downward into the cavity of the pelvis, was obliged to cross over the tense free border of the ligament with the result that a definite kink in its lumen was made. In all these cases definite adhesions were found to exist between the broad ligament or the uterine adnexa and the pelvic colon and were contributory to peristaltic impediment. These observations convinced the writer that obliteration of the left broad ligament was the only means by which the obstruction to the pelvic inlet could be remedied, and he has done this in 150 cases. All excepting two were relieved of their symptoms. The author says that the chief symptoms indicative of the obstructive effect of a proptosed left broad ligament upon the passage of feces along the pelvic colon are a. constipation; b. left iliac pain; c. right iliac pain; d. flatulent distention of the abdomen; e. gastric disturbance; f. the passage of mucus per rectum; g. pain in the lumbosacral region, and h. a state of chronic invalidism. The operation consists of the removal of a wedge-shaped piece from the left broad ligament, the base of the wedge being at its free border. The technic is described.

Electrical Heating of the Pelvis as a Therapeutic Measure.—Hugo Sellheim (*Monat. f. Geb. u. Gyn.*, May, 1910) has made

successful use of the electrical current to heat a vaginal electrode, while the abdomen was covered with a flat electrode externally. Occasionally the electrode was placed in the bowel. The external electrode is kept in contact with the abdomen by the pressure of a bag of sand applied over it. The vaginal electrode becomes heated and the therapeutic effect arises from this fact. Both electrodes are moistened with salt solution. The cervix becomes reddened, swollen, and even bluish in color, after three minutes. Later it whitens. A marked secretion is produced. The cystoscope shows similar appearances on the bladder wall. A thermometer shows a rise of temperature in vagina and bladder. Diuresis is increased. The heat appears more quickly with a stronger current. The patient feels a burning under the skin electrode. When the bladder is filled with water the temperature rises slowly. With one ampère current the temperature rises to 40° in the vagina. The heat is not an external application but a thorough warming through all the tissues in the line of the current. The application allays pain, and the increased uterine secretion is of value in lessening inflammation. The author has tried this method in two cases, and hopes that other operators will make use of it.

Treatment of Postoperative Hernia of the Abdomen.—V. Pitha (*Ann. de gyn. et d'obst.*, April, 1910) says that perfect adaptation of the fasciæ and the different layers of the abdominal wall is of the utmost importance in maintaining the resistance of the cicatrix. The simple suture was pronounced against at the international Congress of Gynecology at Geneva. The union of each layer of the abdominal wall separately was advocated as the best method of prevention of abdominal hernia. The material to be employed has also been a question for a long time. Silk tends to the establishment of stitch abscesses, making a less solid cicatrix. Several authors advocate catgut as the most easily absorbed material and one whose resistance lasts sufficiently long. At the clinic of Pawlik at Prague for the past twenty years the abdomen has been sutured in three planes: catgut for the peritoneum, the same for the skin with separate stitches, a set of ligatures for the fasciæ. Union by first intention is most important; the development of a hematoma in the wound, suppuration of the wound, inexact coaptation, relaxation of the sutures in the fasciæ, necrosis of the fasciæ, incomplete closure of the wound, extraperitoneal fixation of the pedicle, fixation in the wound of cysts after complete extirpation, drainage of the abdominal cavity with rubber drains, drainage after Miculicz, curetting of the walls or uterus, peritoneal tuberculosis, rapid return of ascites, incessant cough, getting up too soon, severe work soon after operation, pregnancy, and other causes bring about stretching of the cicatrix. The lower part of the abdominal wall is most frequently affected. Since a careful adaptation of the muscles and fasciæ has been customary, the number and size of herniæ has diminished. Complete success of

an abdominal operation cannot be guaranteed because of the unknown factors that may enter into the healing process. In operating for hernia the opening of the peritoneum is an element of danger as great as that of the abdominal cavity. To obtain union by first intention the author advocates every attempt to remove and prevent clots, irregularity of the wound, and to eliminate the necessity of drainage. Pawlik excises the cicatrix, making a lenticular incision on each side, opens the hernial sac preferably in the upper part of the wound, returns to the abdomen the prolapsed intestines, clamps and removes the adherent and degenerated portions of the omentum, closes the layers of the peritoneum, after removing the cicatricial portion, and sutures it in points with catgut. This method of operation is new in that it does not extirpate the hernial sac, which is resected only in the thinned portion, the larger part remaining *in situ*. This constitutes a method of support for the intestines. This method produces no hemorrhage; the adaptation of the layers is perfect and no subcutaneous diverticula are left in place.

The Microcystic Ovary.—Emil Forgue and Georges Massabuau (*Rev. de Gyn.*, April, 1910) say that it is doubtful how large a part the microcystic ovary plays in the pelvic pain, menstrual troubles, and general nervous phenomena that accompany it. Pain is in the eyes of the surgeon the cardinal symptom that demands relief. The gravity and intensity of this pain is hard to explain, but it becomes so great as the menopause approaches that the patient prays for operative interference. Nevertheless, it is a fact that in a large proportion of these cases the pain is not relieved by removal of the ovaries. This pain may accompany the menstrual period or it may occur at regular intervals about ten days after menstruation. It may appear in young girls at the beginning of the menstrual life or at any time with or without puerperal or gonorrheal infection. It is marked on pressure over the ovaries, and on motion when the attacks are in evidence, at stool, and radiating to the thighs and lumbar region. A great number of cystic ovaries never give pain. Those that are accompanied by inflammation are most painful. There are also cases of pain of the same type in which no alteration of the ovaries is found. Some are cured by removal of the ovaries, others are not. The ovaries whose removal cures the pain are those of inflammatory type, with pelvic peritonitis and adhesions. A second class are free in the pelvis and yet are very painful, and surgical interference does not bring about a cure. Retrodeviation of the uterus has been blamed by many authors for the pain. If the uterus is replaced and kept in place much is done toward relieving the painful symptoms. It still seems doubtful which of the pelvic organs is the primary cause of the pain, whether it is dependent on the uterus or the ovaries is still undecided. The authors lean to the opinion that the uterus is an important factor. The arthritic and nervous disposition of the patients seems to have much to do with the

pain. Hemorrhages present themselves under three forms; menorrhagia, prolonged, profuse, painful flowing; regular intermenstrual metrorrhagia; and irregular intermenstrual flowing. All may exist in the same individual. The persistence of hemorrhage after curettage or conservative operations on the uterus indicates that there is an outside cause of the hemorrhage. Such hemorrhage is often cured by removal of the ovaries or even after conservative operations on the ovary, such as resection or ignipuncture. The ovaries of this type are characterized by the overproduction of lutein cells, and it is legitimate to suppose that an increase of the internal secretion causes congestion of the uterus and pelvic organs. Three facts favor this view: entirely sclerotic ovaries in which there is atrophy are rarely accompanied by hemorrhage; hemorrhage is most frequent when there is a marked overproduction of the lutein cells, as occurs in the production of the chorio-epithelioma. These symptoms exist in young women with a true syndrome of hyperovarianism: menorrhagia, precocity, intellectual and sexual, and a fecundity that is remarkable and often hereditarily transmitted. The microcystic degenerated ovary plays a much more important part in the causation of menstrual troubles than in that of pain.

Treatment of Prolapsus Uteri in Old Women by Columnization of the Vagina.—E. Juvara (*Presse méd.*, May 14, 1910) advocates in old women who have passed the menopause and who are afflicted with severe prolapsus the use of the operation devised by Le Fort. This consists of freshening a rectangular oblong portion of the anterior and posterior vaginal wall and suturing them together in such a way that the cervix is supported on a fleshy column resting on the perineum. This procedure is eminently successful, but closes the vagina except for a narrow canal on each side through which any discharge can be drained away.

The Ureters in Abdominal Pelvic Operations.—In discussing the management of the ureters in abdominal pelvic operations, R. C. Buist (*Jour. Obst. Gyn. Brit. Emp.*, April, 1910) says that in those cases where a tumor is burrowing into the broad ligament the ureter should be looked for, and if accidentally injured should at once be treated by implantation. In cases of cancer of the cervix uteri where the parametrium is infiltrated the ureter should be divided above the infiltrated region and treated by implantation in the bladder.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

NEUROMUSCULAR EXERCISES, DONE AT THE WORD OF COMMAND, IN THE TREATMENT OF ROTARY LATERAL CURVATURE OF THE SPINE.*

BY

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(With twenty-six illustrations).

ACTIVE exercises in the treatment of these cases have been utilized as a therapeutic measure for many centuries. Among the surgeons of this age whom I might mention as using them are the late Albert Hoffa, in Germany; Schulthess, in Switzerland; Kirrison, in France, and Lovett, in this country. Yet none of these, nor anyone else in so far as I know, has laid particular stress upon the exercises' being done at the word of command. It is for the purpose of emphasizing the therapeutic value of active exercises done at the word of command that this paper is written. Those who have used this method have strongly advocated it, but judging from their writings and conversations I do not think they fully appreciate the importance of the nervous as well as the muscular elements in the exercise.

There is probably not an orthopedic surgeon who does not advocate some exercises, active or passive, or both. The exercise may consist simply of a few minutes' daily suspension from rings or may be regular gymnastic exercises with a "skilled gymnast" under the "supervision of a physician," whatever those terms may mean. One gymnast in New York City succeeded in developing such strong biceps and other muscles in scoliotic patients that he became at one time the depository for many of these cases.

The treatment of lateral curvature should have for its object: the removal of all contributory causes; the reduction of de-

*Read before the Society Alumni of Bellevue Hospital, June, 1910.

formity; the restoration of normal mobility, and the re-establishment of the normal physical ability to support and move the spine.

Any treatment in which one or more of these objects is neglected is faulty. It may be that the condition is in such a

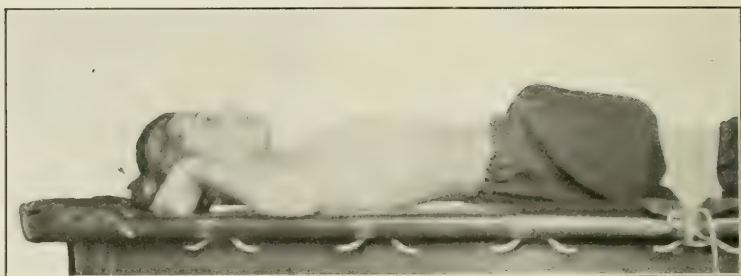


FIG. 1.

stage that the surgeon is justified in attempting but one or two of these objects or even none at all, but in the growing child an ordinary case of rotary lateral curvature needs to be treated along each one of these lines. Too often one surgeon will make a profound study into the contributory causes—will correct the positions assumed in sitting, provide special chairs and

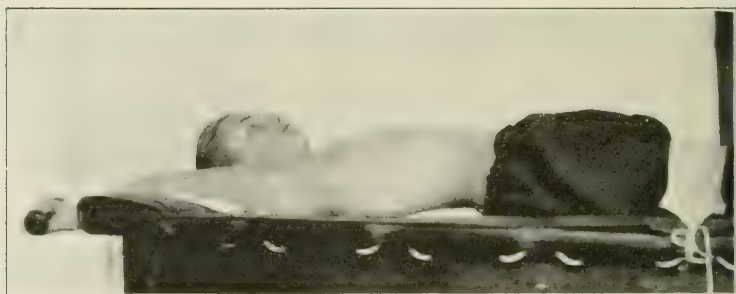


FIG. 2.

desks and piano stools, insist on the patient's sleeping in one particular position, have the wearing apparel properly adjusted, and do nothing more except hope for the best. Another surgeon will do all that and apply an apparatus to hold the child in an improved position. Another will apply the apparatus and neglect altogether the little details of life which may be of evil

influence. Another surgeon will, by exercises in apparatus, many worked on the pendulum principle and most of them giving a passive exercise, try to accomplish cures with or without attention to the other factors named.

One man in London has reported 1,000 consecutive cases treated with exercises, mostly active, in which he reports the results, with very few exceptions, as "much improved." He discards braces altogether. I do not think, however, that his professional brethren in London are fully convinced of the justification of his dogmatic line of treatment. The man who



FIG. 3.

stands out preeminent, in my opinion, as the most conscientious and thoroughly scientific therapist in these cases is Schulthess, of Zürich. I am aware that he is criticised by many, but it seems to me his critics are not his peers in this work. He neglects nothing and accepts every useful factor known to the profession. Much of his apparatus is cumbersome and his patients are practically under his watchful supervision twenty-four hours of the day. Although in this country it would be almost impossible to obtain such desirable control of patients for the long time necessary, it is quite possible to do much more than is usually attempted, and the apparatus necessary for the

exercises herein described are within the reach of everyone willing to accept the responsibility of caring for these cases. Let me reiterate that I do not advise these exercises in every case nor as a sole means to a cure in any case. Every factor, as mentioned above, must be considered and dealt with as far as circumstances will permit.

These exercises are not simply active exercises. They are muscular exercises done at the word of command. Not only do they develop the muscles called into play and exert a mobilizing influence upon the vertebral articulations, but they develop perfect control of these muscles by the higher nervous centers.



FIG. 4.

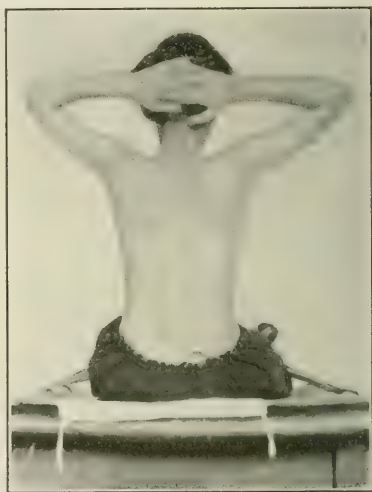


FIG. 5.

Before describing some of these exercises in detail, I wish to interject a word regarding the etiology of scoliosis. Twenty-five years and more ago, Shaffer said: "There is undoubtedly a localized or central neural lesion, which probably is developed early in life in this condition." At the same time Shaffer restated what he had said before regarding the value of habitual malposition upon which so many surgeons were then and are yet laying great weight as a causative factor.

In 1906 Kermisson said: "In short, there is no doubt in my mind that there may be an important relation between the nervous condition and the bony dystrophies." . . . "Not only must vicious attitudes be prolonged for a long time to produce

vertebral deformities, but it is necessary also that the patients themselves present a predisposition." Shaffer's eighth variety of lateral curvature as described in the article above quoted was: "The curve due to an atonic condition of the fibrous and

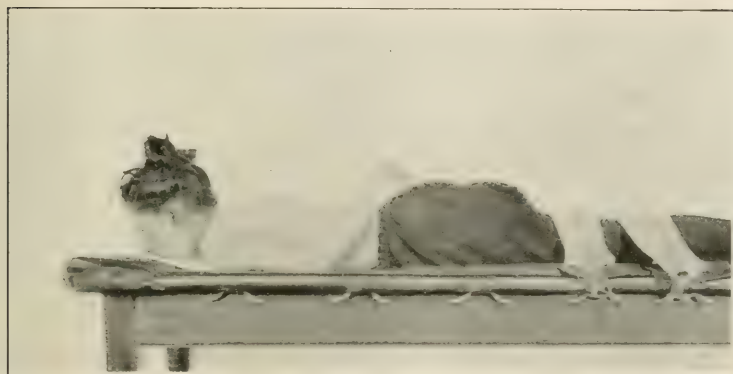


FIG. 6

muscular tissues in the adolescent when prolonged malposition is maintained, as a matter of occupation especially."

Over forty years ago W. J. Little wrote: "Its (habitual standing on one leg) mischievous influence in those who are



FIG. 7.

predisposed to the complaint cannot be doubted; but the capability of mere habitual standing on one leg to produce lateral curvature, unless the predisposing causes have been in operation, is disproved by the comparative rarity with which severe

lateral deformity, *i.e.*, persistent lateral distortion, occurs in persons who from any cause possess a shortened leg." . . . "The comparative infrequency of persistent severe lateral curvature in persons who have a short leg is a proof that something more



FIG. 8.

than the unequal standing is required to induce ordinary lateral curvature."

And in 1852 Edward F. Lonsdale wrote: "I am not sure, however, whether the position (of standing on one leg) is not often, though not always, secondary, and is practised after the curva-

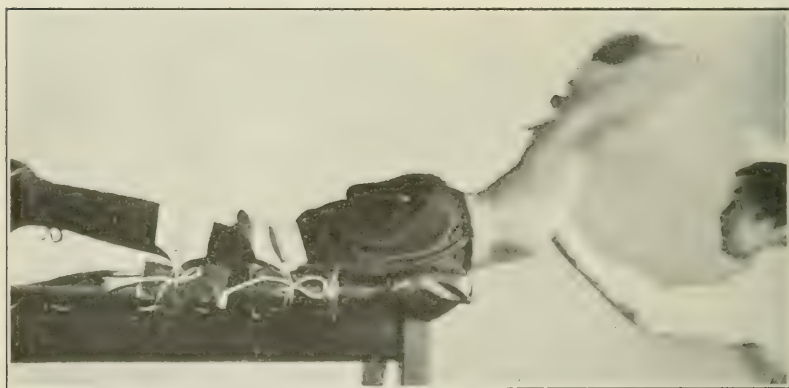


FIG. 9.

ture has commenced, but unobserved by the parents or by the girl herself, rather than a primary cause of the evil."

If, then, a child is healthy, the static curve, a physiological curve, which the spine assumes when writing at a desk too high or too low or when carrying school books on one arm, is in no

danger of becoming a true scoliotic curve, and I would add that the unhealthy child had better be out of doors rather than in the school-room even when provided with "orthopedic desks."

The fact that these exercises at the word of command produce a perceptible change in the condition of suitable patients within,



FIG. 10.

usually, three months, when no change has been affected by many months of treatment without these particular exercises, leads me to believe that though no positive proof has as yet been adduced, Shaffer's theory of a nervous lesion is true, and that it is the involvement of the intrinsic muscles—notably the rota-



FIG. 11.

tores spinalis—which in many of these cases is the primary etiological factor in the production of this deformity. Furthermore, the acceptance of this cause accounts, I am led to believe, for the improvement following these exercises done at the word of command.

Figure 1.—In this view the patient is on her back on a

table; the thighs and legs are strapped down. Only the thigh strap is shown here. There are three exercises done in this position. They are all done for the purpose of strengthening the abdominal muscles. Weakness of these muscles is made evident by an exaggerated lordosis and a protruding abdomen,

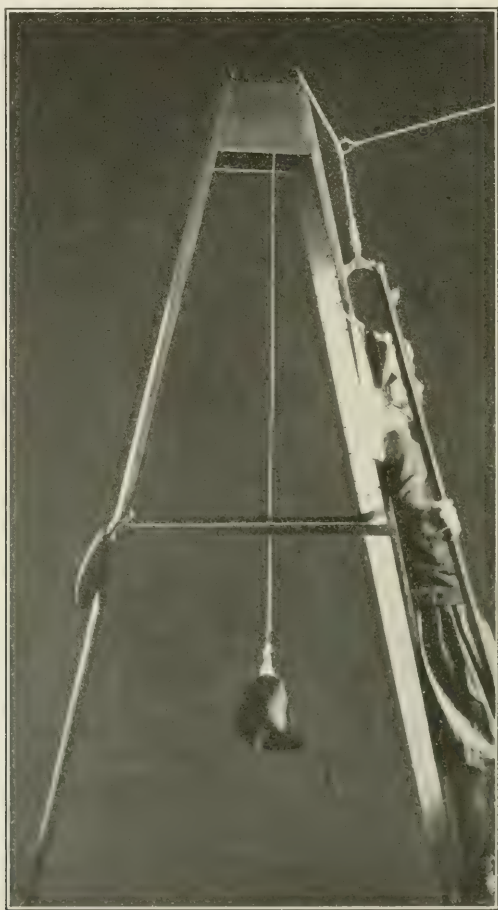


FIG. 12.

and is present in a great many scoliotic patients. The differences in the three exercises consist in differences of the amount of work done. This is accomplished by altering the position of the center of gravity. The center of gravity is the lowest and consequently is raised through the smallest arc, when the hands are

placed upon the hips. With the hands clasped behind the head, the greater weight is carried through the greater arc and the load is increased. When the hands are held above the head the abdominal muscles are called upon to do the greater amount of work.



FIG. 13.

The exercise we shall first discuss is the one calling for the greatest strength of the muscles. In practice this one may not be employed at all until the others have been used for several weeks. If limitation of extension of the thighs exist, thus making it impossible to keep the lumbar spine and the popliteal spaces

on the table at the same time, passive stretching of the anterior muscles passing from the pelvis to the thighs will have to be resorted to.

In this particular exercise dumb-bells are clasped in the hands.



FIG. 14.

They are more for the purpose of giving the hands something to hold than to add weight to the work.

At the *count one* a deep inspiration is taken. At the *count two* (Fig. 2) the hands are thrust above the head; at the *count three* (Fig. 3) the patient sits up; at the *count four* lies down (Fig. 2); *count five*, first position resumed (Fig. 1); *count six*, expiration.

This exercise is prescribed by many orthopedic surgeons, and is done under the personal supervision of some of them. But few if any lay the stress which I wish to, upon the exact way of doing it.

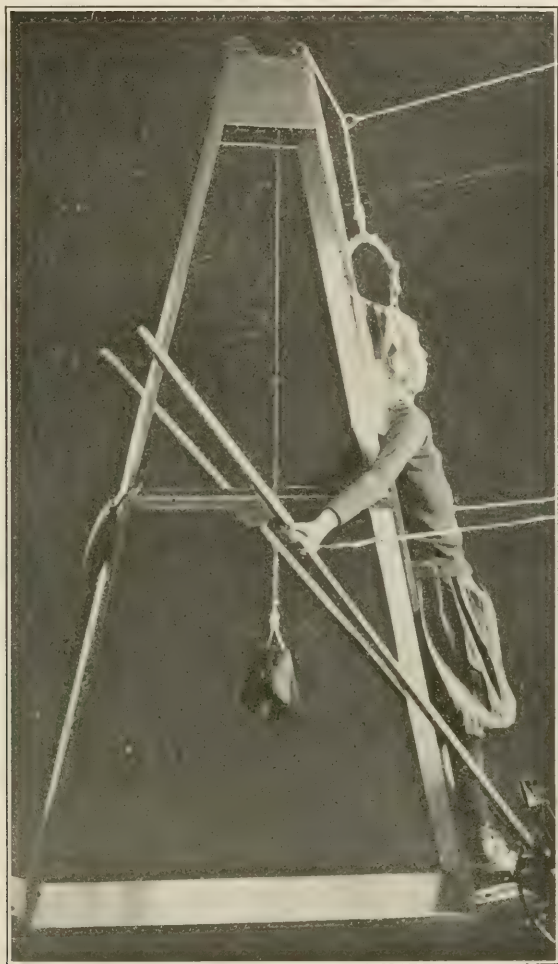


FIG. 15.

In the first place the counts must be considered as commands, to be obeyed promptly, immediately, and not in a lackadaisical "well if I must" manner. That is what I mean by exercises at the word of command.

The second most important factor is the exactness as to every

detail with which the exercises are done. It is useless to demand exactness one minute and permit inexactness the next. With the patient in the position here illustrated (Fig. 1) every part should be as symmetrically placed as is possible. A line drawn through the glabella, tip of nose, center of chin, interclavicular notch, umbilicus, and symphysis pubis should be a straight line, the limbs should be in exactly similar positions. And this symmetry of position should not be attained once in a while, but all

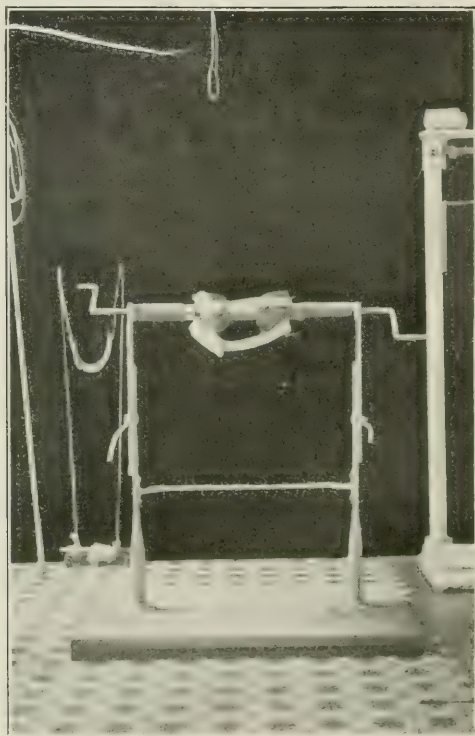


FIG. 16

the time, every instant without any let up. Few cases can attain perfect symmetry, of course, but the asymmetry should be corrected as much as possible.

At the *count one* inspiration is taken. This must be done correctly in each instance. It should be done promptly, but slowly, through the nose, by raising the chest; the shoulders should not be raised, but of course the chest will push them up to some extent. The aim of the patient should be to raise upward and

forward the sternum. At *count two* (Fig. 2) the hands are thrust upward quickly and evenly. At *count three* (Fig. 3) flexion is produced at the hips. The arms must not be allowed to advance ahead of the body. The spine is kept rigid and not allowed to flex on itself as it is inclined to do. While in this position the symmetrical position assumed while lying flat must be preserved.

At *count four* (Fig. 2) extension takes place. The body must not sink backward or fall, but be kept under perfect nervous and muscular control. To such an extent must this control be

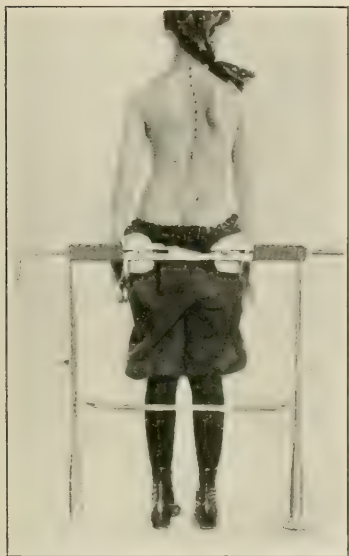


FIG. 17.

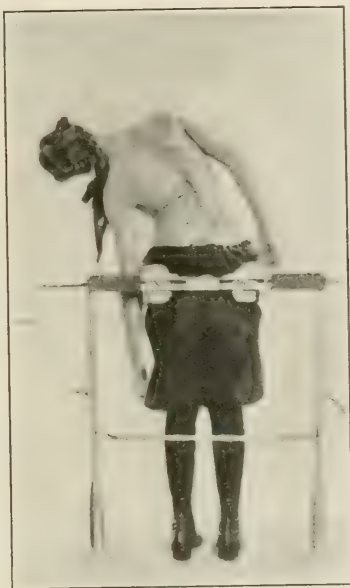


FIG. 18.

maintained that at the command "stop" the patient will arrest movement at any position between flexion and extension.

At *count five* (Fig. 1) first position again, and at *count six* expiration. Then a rest. During *rest* perfect relaxation must be obtained. No muscle must be in readiness for the next exercise.

Correction of asymmetry is made as far as possible and several normal breaths allowed before resuming the exercise. Sometimes a few seconds and sometimes a minute or more may be necessary to obtain perfect relaxation, but it should exist perfectly before proceeding.

The exercise with the hands on the hips has four counts. At *count one* inspiration. At *count two* (Fig. 4) flexion with the

same care as to the preservation of details. At *count three*, extension, and at *count four*, expiration.

With the hands behind the head, the counts are also four. *one*, inspiration; *two*, flexion (Fig. 5); *three*, extension, and *four*, expiration.

To exercise the spinal muscles the patient is strapped to the table as in Fig. 6, with the hands clasped behind the back. At the *count one*, inspiration; *count two* (Fig. 7), the hands are thrust downward and the spine extended (the nurse is holding the patient that the picture might be taken); *count three*, the first position is resumed (Fig. 6); *count four*, expiration.

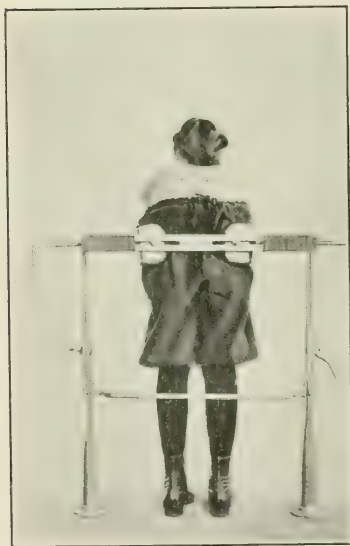


FIG. 19.



FIG. 20.

By adding a lateral bend to the extension (Fig. 7), a lumbar curve may be influenced very effectively, thus adding two counts.

An exercise calling for a greater amount of work may be done over the end of the table. Figure 8 shows the position of the patient, the hands are resting on a stool. *Count one*, inspiration; *count two*, the hands are clasped behind the head and the nurse removes the stool; *count three*, extension (Fig. 9) (the nurse holding the patient for the picture); *count four*, flexion (Fig. 10); *count five*, extension again; *count six*, original position (Fig. 8).

In this and the previous exercises care must be taken that the

movements are made in the anteroposterior plane of the body, and that the body is not diverted to one side.

Figure 11 is a resting board. It can be raised or lowered. It shows a foot-board to prevent sliding down, and a hole for the occiput to permit of the patient lying perfectly flat and relaxed. In these exercises it is absolutely necessary that the stage of



FIG. 21.

fatigue is not reached, and to avoid this rests on this board are given when necessary.

Figure 12 is the incline. This consists of back-boards arranged at an angle of about thirty degrees from the vertical, at the bottom are foot-boards at right angles to the back-boards. At the top are pulleys to carry the rope to one end of which is attached a halter and to the other weights. The weights can be regulated by adding or removing shot bags.

Figure 13 is a front view of a patient in this apparatus. The poles are stuck into holes at the corners of the foot-board and have elastic cords attached to them, running to a hook into the wall directly in front of the patient.

Figure 14 shows the back cushion to fill in the lumbar curve when the patient is old enough to have this curve developed.



FIG. 22.

This cushion is hung from hooks at the back of the board and can be easily lowered or raised or removed if desired.

The exercises consist of four counts: After the patient is in position, the halter and weights adjusted and the poles grasped in the hands, *count one* is given for a full inspiration. At *count two* (Fig. 15), extension is made of the arms; *count three*, flexion

(Fig. 12); *count four*, expiration. Symmetry should be preserved at all times as in all exercises, the commands given crisply and sharply and immediately obeyed.

Figure 16 is a pelvic fixation apparatus. At first I used a wooden machine, such as is recommended by some surgeons, but it did not stand the strain. It may have been because I did not make it of hard wood throughout. This is a substantial steel affair which I have used for two years. It consists of two uprights



FIG. 23.

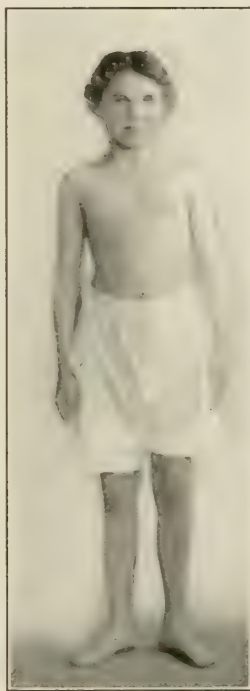


FIG. 24.

raised from a wooden platform. These uprights can be lowered and raised by the screw-clamps. A bar connects the top of the uprights. On this bar travel two padded steel flanges, which are moved in or out by screws worked by the handles. Straps in front complete the girdle of the pelvis.

In this figure may also be seen an apparatus for exercises in the cervical region. A leather cuff has ropes attached to either end, which then pass over pulleys set in the wall and have weights attached. The patient sits on a stool, with the side to-

ward the wall, usually the concave side of a cervical curve, and the cuff is placed over the side of the head just above the ear. The lateral flexion of the head and neck away from the wall pulls up the weights. This exercise is done also by command.

Figure 17 is the back view of a patient in the pelvic fixation apparatus.

The exercises offered by using this machine are extremely

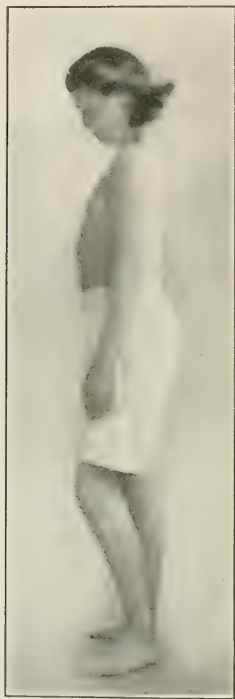


FIG. 25.

varied. The studies of Lovett, to whom the profession is greatly indebted for his work on this subject, teach us that motion in the spine varies according to the position of the spine. For example, the curving of the spine in lateral flexion takes place lower down with the spine in hyper-extension—that is, leaning far backward while in this apparatus—than it does in the upright position. And if the patient bends forward the curve of the lateral bend will take place higher up. Thus a lumbar curve is more effected in the upright position than in the flexed position. While in

hyper-extension the curve from the lateral bend will take place almost entirely between the fourth and fifth lumbar, and the fifth lumbar and the sacrum. The rotation which takes place in conjunction with the physiological lateral bending of the spine will vary also as to the locality, this rotation not being the same in a lumbar curve as in a dorsal curve.

In selecting exercises for this machine it is advisable to try flexions, extensions, side bendings, etc., in the various positions, and thus find out just which tend to increase limited mobility and reduce deformity. All movements are done by word of command: *count one*, inspiration; *count two* (Fig. 18), side-bending, the greatest movement taking place in the dorso-lumbar region; *count three* (Fig. 17); *count four*, expiration.

To influence the dorsal curve and the rotation we have: *Count*

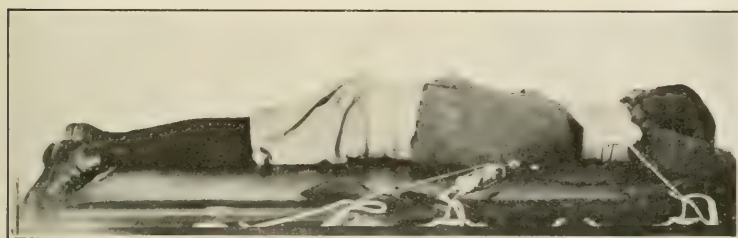


FIG. 26.

one, inspiration; *count two* (Fig. 19); *count three* (Fig. 20); *count four* (Fig. 19); *count five* (Fig. 17); *count six*, expiration.

The setting-up exercises, although used by many surgeons, are not usually done as we would recommend. Figures 21, 22, 23, patient stands in her best possible position; that is, feet forming a square, knees fully extended, abdomen contracted, back flat, chest raised, chin back to plane of interclavicular notch, or nearly so and tilted so that axes of orbits are directed a little upward. At *count one*, inspiration; *count two*, flexion from hips (Fig. 25) back flat, face directed forward; *count three*, resumption of first position (Fig. 24); *count four*, expiration. Figures 24 and 25 show incorrect standing positions. The feet toeing out, the flexed knee, the asymmetry of the shoulders, and the lowered chin are errors particularly marked.

Figure 26 is not an active exercise and does not belong to this series. It represents a patient with straps applied for the ob-

ject of mobilizing the spine. Two straps hold the pelvis and shoulders to one side of the table, another strap passes from a cleat on this side of the table over the back of the patient, passing over the kyphos around the other side and returning anteriorly to the patient, between the body and the table, is secured to a pulley. Another pulley, as shown in the illustration, is attached to the table, and a rope roved between the pulleys gives one the means of producing a constant steady pressure in the proper direction to cure the deformity, both rotation and curvature. Each of these blocks have three pulleys so that the force may be easily regulated.

In this case the patient is entirely upon the table. As far as I know, other surgeons using these straps have the child leaning over the table and partly supporting themselves on their feet. As I leave them in this for from ten to twenty minutes, I deem this the most restful way. The straps are tightened from time to time.

Having selected the exercises necessary for a given case, they should be arranged in such order as to vary the muscles used in succession and give intervals of rest at the most opportune times. The time given to each exercise varies from two to three minutes for some of the difficult ones, and for those beginning treatment, to twenty minutes for others.

The patient's word should not be trusted too confidently regarding fatigue. Careful watching will show a hesitancy in obeying the commands or incompleteness in their fulfilment when fatigue is beginning. It is well to take the pulse frequently in weak patients, and a fortnightly record of their weight is valuable.

PERICARDIAL ADHESIONS IN CHILDREN.*

BY

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PERICARDIAL adhesions occupy a large part in our knowledge of heart pathology in early life. They do not occupy as large a part in our clinical work as the subject warrants.

Pericardial adhesions were recognized in bodies very early—the ancients knew of them. Galen writes of absent pericardium. Morgagni and Vieussens describe the obliterating variety. Laennec and others of his day were familiar with the condition anatomically, but not clinically.

The real clinical study of the condition began with Collis in 1824, when he recognized a pericardial friction sound; and the clinical study, even after all these years, is not complete. Osler states that the condition is more frequently recognized at autopsy than during life.

Etiology.—Adherent pericardium may occur at any age, but has its origin most often in the middle period of childhood. It may follow one acute attack, or more often a number of acute attacks of pericarditis, or it may start as a chronic fibrosing process. In general, it may be assumed to be always of inflammatory origin. To discuss the bacteriology would be to state our real knowledge of the cause.

Of predisposing causes we can only mention the early susceptibility of childhood to infections—especially of the serous surfaces of the heart. The first and by far the most frequent cause is rheumatism. Sturges reports 100 fatal cases of heart disease from the Great Ormond Street Hospital, London. Of these, fifty-four were definitely of rheumatic origin, while in forty-six the rheumatic element was not clear. In all, there were only six cases which showed no pericarditis. Dr. Poynton points out that the incidence of pericarditis of rheumatic origin increases from five up to ten years; the opposite being observed in pericarditis from other causes, especially pneumococcic, in which 84 per cent. occurred before four years of age.

Males, even in early life, are more often affected than females.

* Read before the Chicago Pediatrival Society, May 24, 1910.

The relation of pericardial rheumatism to joint infections can hardly be said to be of any importance whatever, in children.

The heart must be considered to be a primary localization. The endocardium is usually involved with the pericardium—in fact, the condition is most often a pancarditis, or simply a carditis, as some writers designate it. The proportion of extensive adhesion cases that follow the ordinary acute pericarditis is not possible even to estimate, as the number of cases of adhesions that go undiagnosed are large.

Specific organisms were described as early as 1878 by Klebs, and since then by many observers. The organism known as the micrococcus rheumaticus has been found in the largest number of cases, and is described by Triboulet, Wasserman, Poynton, and Paine. It is supposed to gain its entrance into the body through the pharyngeal adenoid tissue, and to cause all the lesions of rheumatism. Its absolute etiological position is not completely settled.

The relation of chorea to pericardial lesions is closely associated with, and closely allied to, the bacteriology of rheumatism. The pneumococcus is a not infrequent cause of pericardial inflammation either by extension or through the circulation. The pericarditis, being a part of a pneumococcus septicemia, occurs most often in very young children.

Arthritis deformans has a chronic pericarditis for one of its lesions, especially in the more acute varieties of earlier childhood. The gonococcus is occasionally a cause.

Some general infections may be causal, such as scarlatina, where the kidneys have often been blamed, measles, typhoid, diphtheria, purpura, hemophilia, etc. Epidemic cerebrospinal meningitis often causes acute cases, but few permanent adhesive cases are found after this disease. Septic infections (pus organisms) are undoubtedly common enough; but as the suppurative cases mostly die, and bacteriological examinations are uncommon, the relative proportions of these cases to the rheumatic and those secondary to chronic joint changes, etc., will offer a fertile field for investigation. Tuberculosis of the pericardium, both primary and secondary, is not so very infrequent, with all its sequence of pathological changes, which simulate the ordinary picture of adherent pericardium, but this lesion must be regarded as a disease in itself.

Pathology.—The extent and firmness of the adhesions vary over a wide range. The tissue itself is ordinary fibrous and

cellular scar tissue, often with calcareous changes of varying degree in old cases.

(a) In a large proportion of the cases there are merely partial adhesions in the form of plaques or bands of varying length and degree. They are most frequent a little above and to the outer border of the left auricle and the outer side of the right auricle, and the ventricles which rest upon the sac and over the great vessels at their highest point.

(b) Another group of cases may include those in which the adhesions are quite general between the pericardial layers.

The outer surface being quite free, the adhesions are in bands and areas, but not absolutely obliterating the pericardial cavity, although they may apparently do so physiologically and clinically. The degree of thickening of the pericardial layers may be remarkable— $1/4$ to 1 inch even—usually greatest in the visceral layer. In this variety the heart is really enclosed in a dense fibrous case.

(c) In another class of cases the adhesions are almost completely extrapericardial, binding that structure by dense bands to all or any of the neighboring structures, due usually to pneumonia, tuberculosis, and septic processes. This is really a chronic mediastinitis.

(d) In the most serious class of cases both an external and internal adhesive process is present, forming the familiar indurative mediastino-pericarditis.

(e) Cases have been observed with very marked thickening of the pericardial layers with no adhesions. These cases may produce severe symptoms.

(f) A group of cases has been described by Heubner and others in which widespread changes have been observed such as perihepatitis, mediastinitis, obliteration of the pericardial cavity, fibrous changes in the lungs, with the secondary changes following such lesions.

The heart and great vessels rarely remain normal, suffering all the many changes from interference with movement, constricting fibrous tissue, associated valvular lesions, and myocarditis.

In general, where the adhesions are few and not tense, they have little influence in themselves, the heart having been found normal many times under such conditions. But in the more extensive cases, and especially where the myocardium is also damaged, very marked changes are found. In the majority of

cases hypertrophy and dilatation are present to a marked degree. It is in these cases of rheumatic origin in children that the truly enormous hearts are found.

In a minority of cases—those in which great injury has been done to the myocardium and circulatory system in the heart proper, the ability to hypertrophy may be almost absent and a small heart be present.

Endocardial lesions increase the changes by added heart embarrassment.

The great vessels may be constricted by fibrous bands to a degree to interfere with the action of the heart as well as to cause dilatation of the vessels.

The general findings are those of the original infection plus those of broken heart compensation.

Clinical History.—It is obviously impossible to give any definite clinical description that will apply even to the majority of cases of adherent pericardium. All that may be done is to point out the individual symptoms and signs which may be associated with the condition.

Many cases even of extensive adhesions go through life with no marked inconvenience. In a number of other cases there is a prolonged history of cardiac and respiratory disturbance usually attributed to the associated lesions. In another group of cases the picture of hepatic cirrhosis will be present.

Pain is not infrequent, precordial and radiating over a wide area. Skin hyperesthesia is often noted.

Palpation and tachycardia, where present in children with no definite findings, often indicate the formation of pericardial adhesions.

Dyspnea is a varying symptom, but one, nevertheless, frequent and urgent in children.

A very large group of cases present symptoms referable to venous congestion, some due to myocardial lesions, others to the peculiar location of fibrous bands, constricting the large vessels. These symptoms may develop gradually and are often very persistent. Effusions in the serous sacs may develop with great rapidity.

Physical Signs.—At times the lesion may be readily diagnosed by signs produced by the adhesions themselves; at other times few signs may be present where very extensive lesions exist. But the diagnosis will rarely be missed altogether if the patient is carefully examined, the soft thin walls of the

child's chest greatly exaggerating the signs as well as making them more readily detected as compared with the adult patient.

I. *Change in shape of precordia.*

(a) A bulging of the chest wall of extreme degree in children, due to the enormous size the heart often attains.

(b) A retraction is not so common and is due usually to thick external adhesions.

II. *Signs associated with cardiac movements.*

(a) The apex beat may show all the changes found in cardiac lesion in general. Most characteristic is its wide displacement often high upward, not corresponding with the area of the heart dullness, or great feebleness of the apex beat, when the heart force is comparatively good.

(b) The impulse is commonly transmitted over a wide area, strong and superficial as if the heart were close to the chest wall, often undulatory in character. In enormously large hearts the impulse may be felt over a very large part of the chest and feels as if one actually had the hand directly against the heart.

(c) Systolic recession or retraction is a very important sign in the diagnosis and should be very carefully noted. It may be discussed under three groupings.

1. Recession of the immediate apical area—during systole; it is usually associated with a definite apex beat, but may occur when no visible apex beat is present.

2. Systolic depression of more or less of the pericardial region, generally involving one or more of the intercostal spaces to the left of the sternum. The movement is sometimes distinctly wavy. Where the systole is very powerful and the adhesions strong, the cartilages may be retracted; even the lower half of the chest may be so retracted. This phenomenon is said to be most marked at the height of inspiration.

3. Retraction of the posterolateral portions of the chest wall; the so-called Broadbent sign due to the tugging on the diaphragmatic attachment, is a well-known sign.

(d) Diastolic shock on concussion. This is a very exceptional but very valuable sign, occurring only where the pericardium is firmly adherent to the interior chest wall, and the heart well hypertrophied; the systolic shock is felt by the hand as a "back-stroke."

III. *Cardiac Dullness.*—Adhesions in themselves frequently do not cause hypertrophy—nevertheless, in cases where adhesions are associated with endocardial lesions enormous hearts are found.

IV. *Auscultatory Signs*.—As a general statement no auscultatory sounds are in any way pathognomonic, although many changes may be found: as, a peculiarly sharp first sound or a very muffled one; or again it may be prolonged or duplicated. The second sound may apparently be duplicated. Weakened sounds are frequent.

A rough pericardial friction sound may remain long after all acute symptoms are past. Usually it is heard over a very small area, a double friction sound over the base is often enough heard. Endocardial murmurs are frequently associated with pericardial lesions and often modified by them, secondary valvular murmurs due to dilatation are frequently present.

V. *Signs Connected with Respiratory Movements*.—It is well in all cases to study the respiratory movements. We may find that a wide cardiac impulse is not affected by inspiration, or the pericardial dullness not altered. This indicates wide external adhesions; also the left side may be much hindered during inspiration, its excursion much less than the right side.

VI. *Arterial Signs*.—Pulsis paradoxus (Kussmaul's sign). The pulse intermits during inspiration, most often in indurative mediastino-pericarditis; this may occur in perfectly healthy subjects.

There may be peculiar movements in the great vessels of the neck as if the blood current was hindered in its flow; it gives one the impression that the ventricle is making an effort to drive the blood into these vessels, but is prevented from doing so effectually by adhesions. The arterial movements may be modified by valvular lesions.

VII. *Venous Signs*.—The cervical veins are frequently dilated in cases of pericardial adhesions, and should a tricuspid regurgitation develop they pulsate.

Friedreich's Sign. A sudden collapse of the veins of the neck during ventricular systole is often present, and when associated with systolic retraction of intercostal spaces is a very valuable sign.

Swelling of the veins of the neck during inspiration, concurrent with pulsus paradoxus due to impeded emptying of the systemic veins, has been described as a sign of adherent pericardium.

VIII. *Skiagraphy*.—With the fluoroscope, bands of adhesions may often be made out. But more important is the fixation of the dilated heart itself.

Course.—Cases may practically be divided into three groups.

1. Those in which compensatory changes are well established and no marked symptoms develop.

2. Those in which compensation easily breaks down, presenting all grades of cardiac symptoms; this group comprises most of our cases in practice.

3. Those cases in which compensation is never established and failure of the heart is progressive from the first.

Diagnosis.—In this regard we can only repeat that the largest number of cases are never diagnosed—many of them causing no symptoms—and others are overlooked in the presence of other heart lesions. The importance of making a diagnosis in childhood is great, and only by studying each case separately and considering known heart pathology, especially as it is peculiar to childhood, will we be successful.

Prognosis.—According to F. Fisher and others, adherent pericardium is the most serious form of cardiac disease in children. The statement is also made that after the age of twenty years acute pericarditis, that immediately recovers, is rarely followed by serious consequences. Sequeira's observations show that in young subjects death occurs at different periods of life in the two sexes: in females, a pericardial lesion leads to death between the twelfth and fifteenth years of life; in boys the failure occurs later—namely, the sixteenth to seventeenth years.

In general, the prognosis depends on the complicating or associated heart lesions, the extent or crippling power of the adhesions determining the possibilities.

Other factors that influence the prognosis are the social station and condition of existence of the patient, adherent pericardium materially adds to the dangers of intercurrent affections, especially pulmonary infections.

Treatment.—When once an adhesive pericarditis has been established we must content ourselves with symptomatic treatment of its complications—that is, cardiac incompetency as distinct from any cardiac lesion. The management is most important, regulation of the child's exercise, breathing exercises, care of the general health, and above all selecting the future occupation of the individual.

The prophylaxis of acute rheumatic infections is a rich field for our efforts. Especially the care of the heart. The operative procedure as recommended by Brauer; that is, resection of the ribs and cartilages, even the sternum may be in place in some cases of extreme external adhesions.

SOME OBSERVATIONS ON THE MIDDLE EAR.

BY

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THE title of this paper, "Some Observations on the Middle Ear," is not very specific, and it is so intended. The middle ear presents a vast field for scientific investigation and deduction. An attempt on my part to even superficially treat the whole subject of middle-ear disease would be an undertaking of gigantic proportions and would demand on the part of my readers more patience than mankind should ever be called upon to exercise.

No region of the human body can undergo greater deterioration without the knowledge of its possessor than the ear. It is not unusual to observe patients who do not consider themselves deficient in hearing but who, on examination, are found to have a hearing distance of less than one-tenth of normal. According to the law that the intensity of sound varies as the square of the distance, these people have less than 1 per cent. of normal sound perception. Man inherits much greater acuteness of hearing than he is called upon to use if he lives in a civilized community; therefore he does not notice a greatly diminished hearing sense and is able to dispense with but a small fraction of his natural hearing, even to less than 1 per cent., without interfering with his daily life.

One ear may have normal hearing with total loss of hearing in the other without the knowledge of the individual so affected, until something occurs to interfere with the hearing of the good ear. This is a very different situation from that which is found when dealing with the eyes. The result is that in many cases the pathological process has gone so far that treatment is very discouraging.

The causes of deafness occurring in middle and later life are due to so-called chronic middle-ear catarrh, in which there is a gradual process of fibrosis, atrophy, and degeneration affecting the membrana tympani and the contents of the middle ear.

This results in sclerosis, loss of normal cell elements, and deposition of lime salts; conditions which can be combated successfully in their incipency, but which when the tissue changes are long-standing and extensive, make stubborn resistance just as similar conditions would affect the eye or any other part of the body.

Chronic suppurating diseases of the middle ear are the causes of most of the remaining cases of deafness. This latter affection is dangerous to life as well as detrimental to hearing. The decrease of hearing power is in proportion to the destruction of the tissues of the sound-conducting and sound-perceiving mechanism of the ear, and becomes greater with the continued formation of pus. The parts which are destroyed as a result of a destructive purulent process cannot be restored in the ear any more than in other parts of the body. This is true with the exception of the membrana tympani, which has a remarkable power of repairing its defects by substituting a cicatricial membrane for the parts destroyed. The suppurative process may in chronic cases be so slow and the destruction of tissue may go on so imperceptibly, that the patient does not realize his condition. Carious destruction of bone may progress even to exposure of the meninges without any definite subjective symptoms except an occasional headache. The early examination of the ears will detect the cause of insidious loss of hearing before the damage is beyond remedial measures. It is customary to seek an otologist's advice when there is an acute ear disease or when there is enough loss of hearing to cause much inconvenience, both of which indicate advanced pathological changes. The changes progress and cause serious damage before their presence is suspected by the patient. He does not seek advice until he is no longer able to carry on his daily avocation and the effort to hear becomes a serious burden. The necessity for prophylactic watchfulness of the ears is greater than a similar care of any other part of the body.

Vertigo, tinnitus, deafness, and danger of systemic infection and intracranial lesions from chronic suppuration of the ear can frequently be prevented if the morbid changes in the ear which produce them receive early and adequate treatment.

It has been suggested that the ears be carefully examined for any functional or organic disturbance whenever there has been any severe constitutional disturbance or when there has been an affection of the upper respiratory tract; inasmuch as

serious damage to the ears may take place without the knowledge of the individual.

When the individual is aware of the impairment, the pathological changes have advanced far enough to render a good result oftentimes very difficult.

It is difficult to believe that practically all of the life-saving work in ear disease has been limited to the past thirty-five years. Schwartze's work was published in 1873. Before that time mastoid operations were not performed unless a perforation of the cortex of the bone had taken place with consequent swelling, redness, and fluctuation over the mastoid process; and even at the present time it is not impossible to meet practitioners of medicine who have never observed a case of middle ear disease with mastoid involvement, which, from their point of view, demanded operation, although they have had patients succumb to one or the other of the well-known intracranial or general complications or sequelæ of the disease without having ever at any time been aware of the real state of affairs in their patient. This I verily believe in most instances is due to negligence rather than to lack of knowledge on the part of the attending physician. The busy practitioner does not take the time to make careful observations and daily examinations of the ear, even in the presence of those acute infectious diseases which he surely knows in a larger percentage of cases result in middle-ear infection.

The formulation of rules for the guidance of those who have not the benefit of a special knowledge of the subject at hand is always a difficult undertaking, and in this case the difficulty is increased from the fact that the structure of the parts involved and the virulence of the infection are so variable that the symptoms, subjective and objective, vary likewise, even when the conditions in the bone are similar; and in view of these circumstances it is always better to err, if we err at all, on the side of safety and operate too early rather than too late.

It would be difficult to estimate the advantages of periodic examinations of the ears and the benefits which would accrue to mankind, through the easy correction of aural defects, which, untreated, become later serious or incurable, impairing the hearing and menacing the well-being or perhaps even the sanity and life of the individual.

Prophylaxis is the effective weapon at our disposal. The general practitioner used, in former times, to hold two views of

diseases of the ear: 1. those that would get well without treatment, and 2. those that would not get well with any treatment. The surgical achievements of the otologists in later years have resulted in consigning this ancient view to its proper place along with many other mossgrown curiosities of medical history. Why, then, does there still linger deep in the minds of many outside of this special field, the opinion that the treatment of acute middle-ear diseases is unsatisfactory and hardly worth while; and that the treatment of the chronic cases is absolutely hopeless?

The layman has not yet learned to practise the same economy of his ears as he does with his teeth, for example. He does not go at regular intervals to the ear man as he would to his dentist, in order that commencing defects may be corrected before they become serious. Nor does he go to the otologist as he goes to the ophthalmologist as soon as deterioration has taken place. A slight deterioration in sight is immediately perceived; whereas a great loss of hearing may be brought about without knowledge of the individual. Prophylaxis is therefore important. Correction of inflammatory conditions occurring in the nose and throat are essential to the prevention of future ear disturbances. The treatment of constitutional disorders should receive due and proper attention. Early observation will detect insidious conditions which cause over 95 per cent. of all cases of deafness, and judicious treatment will cure them before serious impairment has taken place. It would not be going too far to suggest that the ears receive careful examination once a year, after every cold, and whenever anything unfavorable is noticed in the ears, which is often the case in some nervous affections, and general diseases, such as tuberculosis, syphilis, and all of the acute infectious diseases, especially the exanthemata. When alarming and urgent symptoms are present, the indications are only too evident.

Too much cannot be said in praise of the work now being done in most of our cities by the department of education of the masses in regard to the diseases of the eye, ear, nose, and throat, and the baneful effects resulting from their neglect when present. Every child must submit to an adequate examination and if found in need of corrective measures, the parents are notified to that end and compelled to adopt proper measures for their relief and cure. In many cases strong opposition has been met with, but after every possible influence has been brought to bear on the parents, a recourse to the children's court is threatened. This

always works. In some of our cities this court will issue a subpoena on the charge of "neglect" in such cases.

I wish to direct your attention particularly to the middle-ear diseases in infancy and childhood. The very general prevalence of these cases is most alarming and the shameful neglect of them is, to say the least, a living monument of discredit to a learned and honored profession.

Of 6,000 school children examined in Stuttgart, up to the age of seven years, 23 per cent. had ear trouble. This illustrates the frequency with which affections of that organ are found in children. Of 22,894 school children examined in the city of Zurich by Laubi, 14 per cent. of all children under the age of four years had some form of ear trouble. Of these (22,894) 24 per cent. had or had had suppurative disease of the middle ear. Durkner reports all of his ear patients with suppurative ear disease, acute and chronic, 36 per cent. were adults and 64 per cent. were children. Of 7,300 cases of ear disease among all ages treated at the Manhattan Eye, Ear, and Throat Hospital, during a period of seven years, 2,116 were among children; that is, 28 per cent. of all ear cases were among children; of these, 3 per cent. had mastoid involvement on admission. Of the 7,300 cases, 27 per cent. of the adult cases gave histories which indicated that their present condition was the sequelæ of an active process during the formative period of the ear's development. The underlying factors causing the prevalence of middle-ear-suppurative disease in infancy and childhood are:

1. General constitutional diseases and the hereditary influences of tuberculosis and syphilis.
2. The prevalence of the exanthemata during childhood.
3. The anatomical structure of the regional parts peculiar to childhood in both the ear and its adnexa.

Of the general diseases, any which tend to weaken bodily resistance lay childhood open to ear disease. Among which rachitis, bronchopneumonia, and gastrointestinal disturbances are to be noted. In regard to the latter, we differentiate between gastrointestinal disturbances *per se* and those bowel-stomach derangements produced by the otitis media. In tuberculosis and syphilis, although the hereditary tendency is toward the production of ear disease, the middle-ear suppuration need not necessarily be of itself tubercular or syphilitic in its pathological findings.

Of the exanthemata, scarlet fever and measles head the list.

In Manchester, England, as high as 20 per cent. of scarlet fever cases had ear complications. The lack of attention which the ears receive in scarlet fever is only too apparent and denotes either gross negligence on the part of the attending physician, or what is only too often the case, ignorance of the need of it. In measles 50 per cent. of all cases suffer from middle ear complications. It might also be mentioned that in acute middle ear disease in nurslings pneumonia is almost a constant result, while in early childhood it is a very frequent result, the pneumococcus being found in 90 per cent. of all ear infections. Grunert holds that there is not an acute infectious disease which does not involve the ear, influenza being particularly prone.

Anatomically, we find causative factors in the lymphatic ring of Waldeyer, especially that part of the ring designated as adenoid. The infantile Eustachian tube is only one-half the length of that in the adult, it is horizontal in position, its lumen is wide open. This favors the entrance of infectious material into the tympanic cavity, which is normally sterile. The infantile tympanic cavity is the same size as in the adult. At birth it is filled with embryonal tissue and detritus which favors the propagation of invading microorganisms and in this way acts as an etiological factor in the suppurating diseases of the middle ear in childhood. The petro-squamosal suture is open in early childhood and the floor of the tympanum is sometimes absent, only the mucous membrane lying between the jugular bulb and the tympanic cavity. This should be borne in mind in doing a paracentesis of the drum, as it is possible to puncture the jugular bulb as well as the carotid artery. The fact that the drum lies almost horizontal at birth makes this accident more likely.

A child will be seized with an attack of influenza, with an accompanying sore throat, and on the next day will have a high temperature; examination of the ear will reveal a bulging drum. The discharge following puncture is apt to be sero-sanguinous, and very sticky. The absence of pain in these cases is common and apt to be deceptive unless one is familiar with the picture.

The clinical picture of a typical case of acute middle-ear sup-puration in an infant or a young child, is usually sudden. The cause may or may not be evident to the observer. The ear condition may be the primary condition or it may be only coincidental to some general systemic disturbance. We may have headache, languor, and more or less pain on the affected side. Both sides may be affected simultaneously. The tem-

perature, as a rule, denotes the severity of the infection. In the very young the degree to which the hearing is affected cannot always be determined. Rigidity of the neck may be present. The presence of headache in an infant or a very young child cannot be expressed by the patient and the pain very often remains unlocalized; pain may be entirely absent. Every child who gives evidence of fever, uneasiness, restless sleep, accompanied by wakeful periods, rolling its head about on the pillow, with an occasional cry of pain, should, in the absence of a distinct pathological condition to account for it, have its ears examined.

Vomiting, stupor, increased uneasiness, convulsions, delirium, and coma are the natural sequence of the above picture unless proper measures have been adopted. With the rupture of the drum these symptoms subside in the absence of intracranial and mastoid involvement. The examination of the child reveals evidence of pain in and around the affected ear; the slightest interference with the child's position in bed, the least shaking or jarring produces repeated cries of pain. Touching the affected ear causes pain. The act of swallowing may cause pain, even in nursing. There may be frequent remissions in the above picture lasting for hours or days. The loss of appetite, however, remains constant. The clinical picture is a most variable one and much could be added to the above.

Just a few words in regard to the treatment of these cases. Again I wish to emphasize most emphatically the very great importance of prophylaxis as demonstrated in the proper management of every acute infectious disease of infancy and childhood. During an attack of any of the exanthemata, the nose and throat should receive special attention, every effort being made to keep them clean and free from all exudate or mucus by frequent cleansing with warm alkaline washes or by using swabs very gently. If the turbinates are swollen, adrenalin should be used judiciously and even weak solutions of cocain may be used. Some men advocate the removal of adenoids during the course of an acute disease; this is a mooted question and must be decided for itself in each case. With these measures adopted, the attending physician should watch for the very first evidence of any ear involvement. The first suspicion of any such occurrence should call for an examination of the ears for any evidence that may be present. When the case has reached the stage of convalescence, the same careful watchfulness should be continued. It is at

this time when we get our kidney involvement and when the emaciation is most marked, and the resistance very much below par, that negligence is most apt to occur. If your patient should, notwithstanding the institution of every prophylactic measure, develop active evidence of middle-ear involvement, then he who hesitates is lost. A painstaking examination of the ear must be made, the ear drum must be inspected and careful palpation made of the parts. The picture differs in no way from that found in the adult, but the position of the child's ear drum must be borne in mind. If we find a red and bulging drum, early and free myringotomy is indicated in all cases. The younger the patient the earlier should this operation be done. It is criminal to wait for spontaneous rupture to take place. The opening left after spontaneous rupture is ragged, the edges slough, and healing is retarded or does not take place at all, and when it does it leaves a large amount of scar tissue. An incised drum heals very readily. Some observations made in regard to this show that as a result of a paracentesis on the first day of the disease, closure of the perforation occurred on the seventh day; on the second day, closure occurred on about the ninth day; on the third day, about the fourteenth day; on the fourth day, about the fifteenth day; on the fifth day; in about sixteen days; sixth day, twenty-four days; seventh day, twenty-six days.*

After incision has been made, two procedures are at our disposal: for the first ten hours we may use a capillary drain, following this at the end of this time by antiseptic irrigations; or we may start the irrigations at once. Unless the drain can be inserted properly do no use it at all. Avoid infection by using rubber gloves and glass syringes. Do not trust the irrigation to inexperienced hands. Keep the opening well open by repeated incisions if necessary. If the subjective and objective symptoms do not begin to subside at the end of twenty-four hours, the need of operative interference may at any moment become urgent. The attending physician should bear in mind that any or all of the possible complications may take place in so insidious a manner that even the most careful observer may be deceived. We may have a brain abscess or a sinus or bulb infection or meningitis, without even a bulging drum or any apparent mastoid involvement. We have a very different situation to deal with in infancy and early childhood than that which we have in adults.

*This of course only holds true in uncomplicated cases and in those cases in which proper after treatment has been carried out.

The picture found on the operating table and in the dead-house is only too often radically different from that which was diagnosed.

The real explanation for the large number of chronic cases of septic middle-ear infection is inadequate and faulty treatment of the acute stage. Chronicity is not a question of length of duration, but when proper treatment fails to relieve the acute condition. Infection by the douche is a fertile source of infection and reinfection. The removal of all forms of nasal and pharyngeal obstruction is important if we would prevent chronicity. This ought to be done as soon as the temperature falls to normal and remains so for five days.

The limits of this paper do not permit my taking up the various complications. It is difficult to lay down definite rules, but it is well to bear in mind that when all of the proper measures have been adopted and the clinical picture does not clear up in twenty-four or forty-eight hours, it is time to make a diagnosis and to apply the proper remedy. Above all, it is our plain duty not to permit these cases to pass from our influence until we have satisfied ourselves that an acute condition has not and will not develop, and that an acute condition, if present, is sure to receive the proper treatment.

119 HALSEY STREET.

INFANTILE SCURVY.*

BY

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SCURVY, from a historical standpoint, is one of the oldest diseases known to medical literature. From the earliest days of man's reckoning this malady has affected the human race. The sea-faring people in particular have fallen victims to this serious constitutional disorder; the earlier voyages of the Phenecians and the maritime people of ancient Greece frequently terminating in disaster as a result of an outbreak of the disease. Richter, writing in 1744, found a very interesting account of scurvy in the Hippocratic era. Reyhingius, in 1620, and Kempe, in 1625, published very graphic accounts of existing endemics of the disease and found a place in their writings for an account of the disease as it swept middle Europe at the time of the Cru-

*Read before the Washington Obstetrical and Gynecological Society, April 1, 1910.

sades. The first real revelation as regard to scurvy came as a result of the labors of a Scotch scientist, Mackalie. Throwing aside the heretofore preconceived notions of scurvy, the result of moral dereliction (a notion at that time preached all over superstitious Scotland) Mackalie wrote a paper under the title "Scurvie Alchemy Discovered" in the year 1683, and recommended the use of chalybeate remedies. Sennertus dissented from the expressed views of Mackalie and held with such tenacity to the ancient and honored theories of the malady as to be accused of hallucinations. Theodore Willis had also the temerity to adhere to the ancient orthodoxy regarding the disease, but Mackalie was to the front with an article in which the name of "Theodore Willis" and the words "erroneous etiology" stood out in bold relief.

Sa. A. Lisnoff relates the history of an epidemic at the Moscow garrison in 1895 due to lack of vegetable diet.

Orloff wrote of the epidemic at the Petersburg garrison in 1899.

In 1744, the English fleet under the command of Lord Anson, took a trip around the world, the termination of which was very disastrous, owing to the severe outbreak of scurvy—the result of a prolonged diet of salt meat. Hospitals for sea-faring men always in the earlier days contained many cases of the disease due to the fact that the men lived on "salt horse."

Dr. Black, of England, in 1876, investigated the cause of failure of the great arctic expedition of that date, and found the trouble to be the old malady—scurvy, and the cause, as usual—"salt horse." In 1862, the United States Sanitary Commission took up the study of scurvy and rendered a report to the effect that the disease was due to the lack of vegetable and fruit diet, and took immediate steps to remedy the defect by sending to the front large quantities of fruit and vegetables.

Outbreaks of this disease have appeared in various parts of this country, *i.e.*, the Chicago epidemic of 1895, and a serious outbreak in the mountains of Colorado a few years later.

Infantile scurvy is comparatively a new disease, having been recognized for less than twenty years as a separate entity from Rickets. Möller (1859-1862) first described it under the name of "acute rickets"; Ingerslev (1871) and Jalland called it scurvy, though Cheadle laid great stress upon its association with rickets. Barlow, in 1883, was the first to bring out the true pathological and clinical aspects of the disease; he regarded

the affection as scorbutic and strongly emphasized dietetic therapy. The Americans and French called the disease scurvy, those from other countries usually Barlow's or Möller's disease. Then followed Naegeli, Jacobsthal, and Frankel, who demonstrated the finer histological changes in this disease. Osler's first edition (1892) mentions the disease, but earlier text-books do not allude to it. In the periodicals devoted to pediatrics, reports of cases of infantile scurvy began to appear about 1890.

Scurvy has occurred in infants for centuries past, but it has *not* been sufficiently frequent for extended or careful study until the past twenty years. During this period, the very common use of sterilized foods and milk has greatly increased the disease. In the majority of cases, scurvy occurs and appears in association with the preexisting rachitis of slight or severe grade, but it may occur entirely independent.

Infantile scurvy is distinctly an affection of artificially fed children, and though, as stated, it has greatly increased in frequency during the last twenty or thirty years, it is rather rare.

Of 100 cases analyzed by Pfaundler and Schlossmann at the beginning of treatment

1 case occurred at	4 months.
1 case occurred at	5 months.
10 cases occurred at	6 months.
10 cases occurred at	7 months.
20 cases occurred at	8 months.
17 cases occurred at	9 months.
13 cases occurred at	10 months.
11 cases occurred at	11 months.
7 cases occurred at	12 months.
7 cases occurred at	13 to 18 months.
3 cases occurred at	19 to 24 months.

Isolated cases have occurred throughout the third and fourth years, the oldest case, six and a half years, was autopsied by Frankel. Boys seem to be more affected than girls. The influence of season is uncertain; cases occur in all countries. Unfavorable social conditions predispose to its occurrence.

Liebig took up the subject of foods and stated as a result of his investigations that meat soaked in brine was deprived of its nutrient juices and thereby rendered almost worthless as an article of food—this was the explanation of what was then called sea-scurvy. The work of Liebig on the chemistry of food-stuffs

shed a vast amount of light on the subject of scurvy and destroyed the ancient theories which formed the antiscorbutic doctrine.

The specific cause of scurvy is unknown; two factors play the principal rôle in the causation: 1. Kind of food the child has had. 2. A special individual susceptibility. Only artificially fed children are affected, and the unsuitable diet must have been maintained for several months. Whether breast-fed children can be affected or not is doubtful, and the few cases of this kind in the literature are not conclusively proven. As severe a grade of malnutrition can occur with mothers' milk as with artificial feeding when the breast-milk does not supply the special needs of the infant (autointoxication) ("Variot"). The loss of certain fresh properties in the milk through heating it is one of the most important causes of this affection.

Individual predisposition is shown by the fact that if twins have had the same diet, one may thrive splendidly and the other become affected. As previously stated, Liebig gave the first impetus to the study of food and with it an inquiry into the causes of scurvy. The results of all investigations are the same, the preservative process employed invariably renders the food in question utterly valueless as a nutrient agent. Owing to the fact that patent and proprietary foods are of comparatively recent origin, the amount of available literature on this subject is limited. Ashby of England, in 1894, artificially produced scurvy in a baby by the use of "municipal humanized sterilized milk."

Cheney, Corlette, and Jones, of England, all agree with the idea that the disease is wholly due to prepared and humanized foods.

The most valuable article extant on the subject of patent and prepared foods is a paper read before the American Pediatric Society. These preparations are held to be responsible for the production of this disease. Even in the artificially prepared milk of the best laboratory the result is the same.

Sterilized and prepared milk of various sorts come first, then pasteurized milk and simple boiled milk, then milk and flour mixture and prepared flour alone, and finally oatmeal gruel and rice gruel. With the use of raw cow's milk, the disease does not occur.

Albertoni has shown that in certain cases of the disease, particularly in a case of long standing, the free hydrochloric acid in the gastric juice is deficient, the total acidity is likewise much reduced

in this class of cases. These facts do not hold good in all cases; they are apparent casual phenomena.

No efficient substitute has been found for fresh fruit and vegetable juices in preventing the disease. On this point all observers and chemists are agreed. Testi and Beri have recently found an organism in scurvy which they claim to be the etiological factor. It is a diplococcus, and upon injection into the guinea-pig produces *some* of the conditions found in scurvy. More detailed work is needed before this can be accepted.

What is this antiscorbutic element? No one knows definitely, but we do know the unavoidable changes which take place when milk is heated and which by some are considered the prime etiological factors in the disease:

1. The destruction of a certain amount of nucleophosphorus.
2. The destruction of enzymes.
3. The change of soluble calcium compounds to insoluble calcium phosphate.
4. The conversion of a certain amount of the amorphous neutral calcium citrate into the less soluble crystalline form. Netter considers citric acid as the specific antiscorbutic constituent of cows milk, but as the latter is much richer in citric acid than is mothers' milk, a deficit cannot easily occur even with cooking.

Scurvy is entirely a preventable disease and it is important to know the foods upon which it is likely to arise.

Patent foods containing dried milk prepared according to directions with water only,	18 cases.
Patent foods prepared with fresh milk,	22 cases.
Patent foods prepared with condensed milk,	11 cases.
Patent foods prepared with sterilized milk,	1 case.
Patent foods prepared with fresh (unboiled) milk,	1 case.
Condensed milk diluted with plain water, barley water or lime water,	5 cases.
Sterilized milk,	3 cases.
Peptonized milk,	1 case.
Boiled milk,	2 cases.

Table by Still.

La Fetra (New York) gives in his paper the following illustrative cases:

- Baby eight months old, Walker Gordon laboratory milk.
- Baby eight months old, Sheffield farm milk.

Baby twelve months old, Mellins' food, peptogenic milk, Walker Gordon laboratory.

Baby ten months old, sterilized milk (home-made).

Baby twelve months old, Walker Gordon and Nestle's food.

Baby nine months old, Mellins' food, malted milk, and dextrinized milk.

Baby fourteen months old, Nestle's food.

These cases were all from private practice. The treatment consisted in the stopping of the foods and the adoption of the usual therapy of the disease—fruits and vegetables. Recovery is reported in all cases. He also lays great emphasis upon the excessive heating of milk as the cause of infantile scurvy, *i.e.*, too much sterilization. The more recent theory upheld by Johannesson, and which is somewhat in accordance with the latest American ideas, is that infantile scurvy is due to some toxin arising in the food, and that this affects only certain susceptible children, while the great majority thrive on the same nourishment, would most easily explain the whole symptom-complex, and the prompt action of dietetic therapy the result of a simple change in diet.

At the present time, all that can be definitely said on the subject is that the "antiscorbutic" element is found par excellence in the juices of fruits of vegetables. This postulate has its support in the fact that without these juices the cure of the disease is practically impossible.

The clinical picture of the fully developed disease is most striking. An infant who has been fed upon one of the patent foods with or without milk or on milk which has been condensed, sterilized, or otherwise altered has been ailing for weeks, has taken food badly and probably lost weight; moreover, the mother says it cries whenever it is touched, and has lost the use of its limbs. The infant is pale, it lies quiet until approached. The legs lie motionless; it cries out in dread of being touched, the thigh flexed and abducted. There may be some swelling of part of one or other of the limbs, obliterating the normal curve. The arms are less often affected. Any handling of the limbs causes a sharp cry or pain. If teeth are present, the gums around them are swollen and purple, often projecting like a mass of granulations almost hiding the teeth, and bleeding readily when touched. The urine is smoky, if not red with blood (Still).

Such are the most important symptoms present, and to recapitulate them, they are:

1. Anemia.
2. Pain on movement.
3. Enlargement of bones. Often separation of the osseocartilagenous junction. Barlow says when such separation occurs at the junction of the ribs and sternum, "The sternum with adjacent costal cartilages and a small portion of the contiguous ribs appear as though they had been fractured by a blow from behind. This phenomena is almost specific. The bones most involved are the lower ends of the femur.
4. Hemorrhagic swelling and softening of the gums.
5. Hemorrhagic swelling of eyelids and exophthalmus.
6. Extravasation of blood into the skin and mucous membrane.
7. Hematuria occurs in 10 per cent. of the cases.
8. The temperature is irregular with no fixed type.

The course is chronic and the mortality is still high as the diagnosis is not often made. It is hoped that with an increasing knowledge of this disease the ability to make a diagnosis will improve and with this the prognosis. Weeks and months are required for the development of the full clinical picture, and then the condition improves or not and death may supervene from cardiac failure or bronchopneumonia, often with a complicating enteritis, or a correct diagnosis leads to proper treatment and saves the life of the child. In many early cases a simple change in diet may work wonders, without even infantile scurvy being suspected. Anders states that hemoglobinuria is frequently observed in infantile scurvy, the hemolytic process resultant of toxic infection.

Briefly, the pathological changes occurring in infantile scurvy consist chiefly of a characteristic affection of the bone marrow and comprise a change of the normal lymphoid marrow into a tissue poor in cellular elements; consequently the ends of the bones become brittle, together with anemia and hemorrhages, particularly the subperiosteal variety, although hemorrhages may occur also into the parenchyma of internal organs and of the intestines.

The leukocytes seem to play but little part in this change and I can find no reference in the literature of any exhaustive or complete examination of blood having been made in any specific case.

In the ordinary case seen early and not complicated by any intercurrent disease the prognosis is good. It must be remembered that in five out of sixty-four cases reported at Kings

College Hospital the disease proved fatal by diarrhea and exhaustion. Even when death does not occur there is sometimes prolonged disturbance of nutrition so that the infant fails to gain in weight for a long time and remains frail for weeks and months after all symptoms have disappeared.

The disease most often mistaken for it is rheumatism. About four-fifths of all cases of scurvy have at one time or other been diagnosed as rheumatism. It is well to bear in mind that if in a bottle-fed baby a progressively severe anemia develops with a coexistent suspicion of hemorrhagic swelling of the gums and tenderness at the epiphyseal ends of the long bones, occurring under two years of age, corroborated by a history of artificial feeding we should at once think of Barlow's disease—infantile scurvy.

It should be differentiated from rickets, periostitis, osteitis, osteomyelitis, osteosarcoma, anterior poliomyelitis.

There are few diseases in which the effect of treatment is so striking as in infantile scurvy; under efficient antiscorbutic diet, the tenderness and pain on movement is usually appreciably less in forty-eight hours and it is usually agreed that as a rule if proper antiscorbutic dieting has produced no definite improvement within four days the diagnosis of scurvy should be questioned. The other symptoms usually remain longer, *i.e.*, the subperiosteal hemorrhage with resultant thickening may persist for some weeks or months.

A proper change in diet without the help of any medication leads in a short time even with greater rapidity than in ordinary scurvy to a complete change in the condition of the patient. Kerley states that in his opinion orange juice is the specific for the disease. Severe and apparently helpless conditions disappear like magic.

In place of the food given previously the child is placed upon fresh, raw, or at most briefly heated cow's milk from a reliable source. Besides this, raw meat-juice should be given and the amount of fresh fruit-juice from oranges, grapes, lemons, cherries, currants, blackberries, apples, pears, apricots, huckleberries, etc., sweetened with sugar.

As far as I know the patent or proprietary meat juices which are so widely advertised are of no value as antiscorbutics. The superior advantage of the use of the potato as an antiscorbutic seems to me undeniable and it is of value with carrots, cabbage, cauliflower, etc. In children of two or three years of

age it may be given together with spinach, stewed fruit, green salads and finally chopped meat.

If an infant is fed upon some scurvy-producing food it should have in addition some antiscorbutic, as raw meat-juice, orange juice, or grape juice.

The necessity for handling and moving the infant as little as possible is obvious, and it is better to let the patient lie undisturbed by dressing, bathing, etc., especially if fractures or separations of bones have occurred.

CASE I.—Baby P., seen in consultation with Dr. H. C. Duffy. Baby six months old, breast-fed for only three weeks, then placed upon several proprietary foods in a vain endeavor to secure some suitable combination. For the last month it has been fed on sterilized milk, home-modified. For two weeks mother has noticed increasing pallor, lassitude, and fretfulness, together with pains whenever touched or even when mother approaches the crib.

Upon examination I found complete loss of motion of the lower limbs, and great tenderness of the lower epiphyses of the femur. The child lies in a semistupor. There is marked anemia, puffiness about the eyelids, and some dyspnea. Gums are purplish, soft, and spongy. Teeth decayed and loose. Gums bleed easily. Temperature 101 in the rectum. Heart sounds weak and distant. Stools loose and undigested. Diagnosis: *Infantile scurvy*. Treatment: A top milk modification and orange-juice. In five days use of legs returned with late complete recovery, though dentition has never been normal.

CASE II.—Laura R., fourteen months old, brought to me from out of the city. Had been treated for several weeks by an osteopath for muscular contractions. Had been fed upon proprietary foods, together with sterilized milk, under the direction of a physician who had diagnosed rheumatism and on account of a preceding iliocolitis some months before had advised the above dietary. The pain became so great during the manipulations by the osteopath that the child would almost go into convulsions during each treatment. When seen by me a typical picture of infantile scurvy presented itself. There was marked discoloration and very painful swelling of the lower end of the femur, a few subcutaneous hemorrhages over the lower limbs with marked pallor and anemia, the skin being of a dirty yellow hue. The child whined constantly, lay motionless, was much emaciated, with gums discolored and bleeding, eyes very prominent. Infantile scurvy was diagnosed and a favorable prognosis given.

Put upon orange-juice, fresh milk, baked potato, and raw meat-juice. Improvement noticed in one week. In one month the child walked and recovery was complete.

POTT'S DISEASE.

BY

ROBERT GILBERT MOORE, M. D.,

Assistant Surgeon in the New York Orthopedic Hospital; Assistant Orthopedic Surgeon to Seton Hospital; Attending Surgeon to University and Bellevue Hospital Clinic, Etc.,
New York.

To thoroughly understand Pott's disease we must know its pathology. Whitman defines Pott's disease as a "chronic destructive osteitis of the anterior or weight-bearing portion of the spinal column." As the destructive process continues, the vertebræ involved, by compression and collapse, throw their respective spinous processes into relief, resulting in an angular deformity.

The name is given to it because its deformity with the resulting pain and sometimes paralysis was first accurately described in 1779 by Percival Potts.

This angular deformity may also result from fracture, erosion of an aneurysm, malignant disease, or syphilis, but in these cases it is not Pott's disease.

The pathology of Pott's disease is distinctly tuberculous. The destructive process starts in the anterior part of a vertebral body just underneath the fibroperiosteal layer of the anterior longitudinal ligament. From this point it advances along the front of the spine and, following the blood-vessels, invades and destroys adjacent bodies. In some instances this process may commence in the anterior of a vertebral body in minute foci near the upper or lower epiphysis. These foci coalescing form a cavity which gradually collapses as the cortex becomes weakened. Sometimes it advances beneath the anterior ligament and implicates merely the periosteum—a form of tuberculous periosteitis known as spondylitis superficialis. The intervertebral discs offer some resistance to the progress of the disease, but as the bodies on either side are destroyed they disintegrate and disappear. The pedicles and articulations that may be in direct contact with the disease are the only portions of the posterior column to be involved. The process may force its way into the spinal cord and involve its coverings, causing paralysis of the parts below.

Surgical intervention in Pott's disease is of little or no avail as the proximity of the spinal cord and vital organs make the use of the knife dangerous.

The outcome of the disease is varied. In one instance—when the infection is small and the resisting powers sufficient to check its further progress—cure without deformity may follow. (Boy in my service under treatment sixteen months had no symptoms for eight months.) In another the disease may be inactive, the granulation tissue undergoing a fibroid transformation or becoming ossified. In this case the deformity may appear and increase with practically no symptoms. In most instances the granulations advance rapidly, destroying the bone or any tissue with which they come in contact, then follows cheesy degeneration, liquefaction, or abscess formation. The liability to abscess is increased by irritation and decreased by absolute rest of the diseased part. In all its stages resistance to its advance and efforts at repair are evident. When this resistance overbalances the tendency to degeneration, cure follows. Repair is sometimes accomplished by ankylosis with solid bone. Ankylosis is usually fibrous, or partly cartilaginous and partly bony, and may be strengthened by a callous formation from the thickened tissues about the site of the disease. Cure may be absolute when the disease has disappeared, or can be assumed when the diseased products undergo calcareous degeneration and are shut in by a layer of solid bone. Sometimes it becomes quiescent or advances slowly, showing its presence by exacerbations of pain or by formation of an abscess long after active symptoms have ceased.

The size and shape of the kyphos is determined by the number of vertebræ involved. If only one it will be sharp, if more than one it will be less angular. Sometimes there is a resulting lateral deformity as well, due to the breaking down of one side of an involved vertebra before the other. The size of the deformity depends upon its location; if at either extremity of the spine the kyphos must of necessity be small. When in the center of the spine the deformity is very marked and its effect upon the internal organs by compression is serious.

Tuberculosis of the spine is more common than that of all the other joints put together and is most frequently overlooked. It most often appears at from three to ten years; although I had last year one case two and a half years old, resulting fatally, and have now in my service one forty-five and another fifty-one years old.

The most common site is in the dorsolumbar region. Prognosis is always grave, it being the most dangerous and serious of all tubercular lesions, mortality being at least 20 per cent. within a few years after onset, mostly from dissemination of tubercular infection, tubercular meningitis. Some die from exhaustion following septic infection and long continued suppuration or from amyloid degeneration of organs and some from pulmonary tuberculosis. Prognosis must be influenced by the surroundings, family history, and probable resisting powers of the patient.

Symptoms.—The most distinctive of all is the deformity resulting from the destructive processes described before. Then the diagnosis is comparatively easy. In the early stages the diagnosis is most difficult, but can be made by a careful and systematic examination. It is most important to make a diagnosis at this stage because the success from treatment depends upon beginning it before deformity has appeared. Again we refer to our pathology and are led to consider such symptoms as "earache" with no mastoid involvement, headaches, persistent sore throat, may be a retropharyngeal abscess beginning—these in the cervical region. Then in the thoracic region we notice the respirations of the patient and are impressed by the evident effort resulting in "grunting." In the dorsolumbar region we are attracted by the story of persistent symptoms of abdominal pain which has defied the efforts of calomel and other digestive necessaries. Also we may note swelling in iliac fossæ. The surgeon is apt to consider the idea of appendicitis. All these collectively or individually should lead the examiner to examine with care the spine.

The distinctive and primary symptoms are: pain, stiffness, awkwardness, weakness, and deformity.

The pain is not localized in the back, but is referred to distant parts of the body having relative nerve supply. Among these we have earache, stomachache, sciatica, and the night cries, significant of a tubercular joint disease. Pain is induced by sudden jars or unexpected movements of the body during sleep and causes these cries.

Stiffness is another important sign and is the loss of normal mobility of the spine. It is in part voluntary and produced by the patient in his effort to adapt his movements and attitudes to the disease and pain in order to avoid strain and jar. Essentially it is an involuntary muscular action contracting and making tense the muscles about the site of the disease. It is demon-

strated by having the child pick an object from the floor and noting the cautious manner in which the act is performed or by having the patient flat on its stomach, grasping the heels in one hand and lifting them from the table.

Weakness.—The child will refuse to walk or stand and will desire support and prefers lying flat on stomach or back, preferably the latter.

Awkwardness or change in attitude is really a summing up of the effects of the preceding symptoms and is indeed diagnostic.

Deformity.—May be bony or muscular. Bony we have described; muscular is the distortion due to spasm or contraction and is most commonly seen in wry neck.

The secondary symptoms are abscess and paralysis.

Abscess.—Its most common situation is retropharyngeal, interfering with respiration and deglutition. In the thoracic region it may be mistaken for pleurisy or empyema. In the iliac fossa it interferes with locomotion and simulates hip disease.

Paralysis, resulting from pressure, is due to destruction of the posterior part of a vertebral body. This comes in the late stage of the disease and only confirms our previous diagnosis. Pott's disease must be differentiated from the following:

1. From lumbago, which is an acute infection of sudden onset accompanied by local pain and tenderness of muscles.

2. From strain of back—like lumbago, pain is localized at point of injury.

3. From sciatica. In this the pain is most often unilateral being confined to the distribution of the nerve. Pain is caused by movements of leg, not of spine as in Pott's.

4. From sacro-iliac disease—more like hip disease. Pain localized to joints involved and not in spine.

5. From hip disease. In infancy it is extremely difficult to make a diagnosis as there is always a sympathetic spasm of hip muscles in Pott's and similar spasm of lumbar muscles in acute hip. They very often occur together, but by carefully repeated thorough examinations we may be able to make a positive diagnosis.

6. From rachitic spine. In this case we make a diagnosis from evidences of general rachitis present. Child prefers to sit, whereas in Pott's the infant invariably seeks to be on its back or abdomen. The projection in rachitis is rounded and not angular, and in prone position may be reduced. There is also no muscular spasm.

In thoracic region, we must note the significance of plain cough or embarrassed respiration. Invariably we note the grunting noise made by the child when breathing.

Must distinguish from round shoulders, rachitic deformity, and lateral deviation. If the careful method of observation is followed, the diagnosis is comparatively easy.

7. Congenital torticollis. This is eliminated by the history.

8. Acute rheumatic torticollis—stiff neck. This passes off in a short time after a sudden onset; the muscles are sensitive to pressure.

9. Acute torticollis persisting is at once suggestive of a cervical Pott's. A diagnostic sign is, in torticollis the chin is turned away from the contracted side, whereas in Pott's the chin inclines toward the affected side. The head is usually fixed in the deformed position and any attempt at motion in any direction is resisted by marked spasm.

The treatment of Pott's is essentially mechanical and hygienic and the general principles follow the idea expressed in Hilton's famous book "Rest and Pain." We have two points in view: first, to prevent further deformity, and secondly, to secure rest to the part, thus enabling nature to assist us. To gain these ends we can use either a frame brace or plaster.

The frames are made of gas pipe, one frame is a little larger and a little wider than the child. This is covered with canvas stretched taut over the frame leaving an opening for bed pan and on this the child is placed with a brace applied. This is known as the Bradford frame.

The other frame is also made of gas tube, a few inches longer and not as wide as the patient. This is covered with rubber cloth and foot pads all being securely held and covered with heavy canvas laced tightly on under side. On this frame the child is securely fixed by an apron. After it becomes accustomed to it the bars are gradually bent, extending the spine to separate the diseased parts.

The patient is kept there about six months.

Plaster treatment I have never employed and so will not discuss it.

The brace is made of two upright bars bent to fit exactly the sides of the vertebræ and padded to prevent chafing; it should have shoulder pieces, straps, and abdominal band, and an apron over all. The hygienic treatment is very important and should be the same as for any tubercular patient.

TRANSACTIONS OF THE CHICAGO PEDIATRIC SOCIETY.

Meeting of May 24, 1910.

The President, I. A. ABT, M. D. in the Chair.

DR. MARY M. E. JOHNSTONE spoke on

ACUTE INFECTIOUS DISEASES AS THE CAUSE OF HEMIPLEGIA IN CHILDREN.

In considering the etiology of hemiplegia in general, we find that one-third of all the cases of spastic hemiplegia in children are due to acute infections, and that any of the acute infectious diseases may be the cause of the disturbance. Congenital syphilis is regarded only as a pre-disposing factor. Seven-eighths of all cases occur in the first five years of life. The right side is more often involved than the left. The onset is sudden with convulsions. Paralysis may disappear immediately, may last a few weeks or remain permanent.

There may be hemi-anesthesia, tremor, choreiform movements or athetosis. Mental deterioration and epilepsy are frequent results. As to the pathology, the condition may be encephalitis, hemiplegia, or embolus. From the clinical picture we cannot determine which. Two cases were reported.

1. That of a girl eight years old who suffered from a severe pneumococcus infection of the throat, lungs, and meninges, with crisis on the eighth day. The onset was very sudden, with severe vomiting; convulsions and hemiplegia of the left side resulted. Five years after the child was perfectly well without any trace of paralysis.

2. Case of erysipelas spreading from a pustule on the right ankle in a seven-year-old child. Forty years later the patient still showed the results of a right-sided hemiplegia. Patient also had epileptic attacks. This is the only case of hemiplegia following erysipelas which could be found in the literature.

DR. H. W. CHENEY.—Dr. Johnstone mentioned nervous shock to the mother before birth of the child as a cause of hemiplegia. I would like to ask her whether she has found any well-authenticated cases in the literature to support that statement. I was not aware of the fact that nervous shock during pregnancy could be a cause of infantile hemiplegia.

DR. JOHNSTONE (closing).—In all the works I have consulted it is so stated, but I did not work up my remarks from that point of view particularly, as I was considering mainly infectious diseases as a cause of hemiplegia in children.

PERICARDIAL ADHESIONS IN CHILDREN.*

By DR. D. L. SCHRAM.

DISCUSSION.

DR. I. A. ABT.—This class of cases is seen often and constitutes one of the most interesting chapters in the story of diseases of young life. The question of diagnosis is of the greatest interest. In the acute cases one frequently is uncertain as to whether it is a case of ordinary acute endocarditis with dilatation, or whether it is a case of pericarditis with effusion, or pericarditis with adhesions, perhaps the so-called villous pericarditis. In many of these cases the condition comes on so suddenly and severely that the friction rub is not heard at all. This complicates the diagnosis.

Another point is the determination of the presence of fluid. It is not easy to differentiate acute pericarditis with adhesion from pericarditis with effusion. I remember several instances in my experience where the heart dilated rapidly and in all directions, and fluid seemed to be present. In two cases a needle was thrust into what was supposed to be the pericardial sac, and the needle entered the ventricle. This coincides with the conclusions offered by Poynton, Paine, and Lee, extensively quoted by Broadbent. The latter stated that cases of pericarditis with effusion are relatively rare compared to cases of pericarditis with adhesions. It seems to me that these authors say that 90 per cent. of the cases that come to autopsy where pericarditis was present were adhesive in character.

Another class of cases where pericarditis is extensive, with obliteration of the sac, are cases of empyema of the left side, where the empyema results fatally. We often find that pericarditis with obliteration of the sac was present, but overlooked, because of absence of clinical signs.

So far as the prognosis is concerned, I agree with everything Dr. Schram said. The adhesions darken the prognosis more than any other one factor. These cases of obliterative endocarditis usually offer a more unfavorable outlook than do the cases of pericardial effusion.

I recently saw a child that suffered early in life with what seemed a pure endocardial attack, without any pericardial involvement. That child is now going through an attack of typhoid. There are loud murmurs present, but the heart is standing it well. This shows that a heart which has had no pericardial damage is much more likely to withstand intercurrent affections than is the heart which is limited in movement by pericardial obliteration. This is true, too. Most of us find that children who have suffered from pericardial inflammations are more likely to lose compensation about the age of puberty. Baginsky attempted to explain this by saying that there is a

* See original article p. 537.

certain change in the circulation at puberty, which makes it more likely the heart will lose its compensatory power.

So far as the treatment is concerned, I have seen the Brauer operation performed twice, and both patients died. Both operations were performed under the strictest aseptic precautions, but in both instances there was a secondary infection which was the cause of the fatal termination.

DR. SCHRAM.—I agree with Dr. Abt that the danger of pericardial adhesions is great at the time that the child is passing through an acute attack of infectious disease.

DR. JOSEPH BRENNEMAN presented a specimen showing CONGENITAL ATRESIA OF THE ESOPHAGUS WITH OTHER ANOMALIES.

The dilated upper end of the esophagus ended blindly just above the bifurcation of the trachea. The distal portion passed from the stomach to the trachea, reuniting with the latter posteriorly just above the bifurcation.

The child had, further, two ureters on each side, one normal and the other represented by only the distal half. All four ureters entered the bladder separately, other anomalies were present in the cord.

The clinical features were: constant flow of saliva from mouth and nose, vomiting after one or two swallows, inability to pass a sound more than 4 1/2 inches. Choking spells with cyanosis, markedly subnormal temperature for several days then fever, rapid loss in weight, sclerema, and death on the 10th day.

DISCUSSION.

DR. H. F. HELMHOLTZ.—I had an opportunity to examine the spinal cord in this case, and found a central canal which was like a slit, except in the cervical region, where it was dilated considerably. The cells of the anterior horn, instead of being situated as normally, were found in the posterior horns and anteriorly, which I have been unable to account for.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS

Meeting of May 12, 1910.

ELI LONG, M. D., *in the Chair.*

THIS meeting was held under the auspices of the Section on Pediatrics with the cooperation of the New York Milk Committee.

THE MILK SUPPLY OF COPENHAGEN.

PROFESSOR BERNARD BOGGILD, Royal Danish Agricultural College, Copenhagen, Denmark.—I am present this evening

to tell you how we solved the milk problem in Copenhagen, the capital of Denmark. This city is situated on the island of Zealand and the adjoining island of Amager, on the strait of the Sound and the Kalvebodstrand. Copenhagen is the commercial center of Denmark. In the year 1890 it had a population of 312,859 and suburbs with a population of 373,123.

Some thirty years ago G. Busck, a wholesale butter dealer and to-day one of the greatest merchants of his country, learned that one of the men in his employ was greatly worried about his baby, fearing that it could not be raised unless good milk could be obtained. It seemed strange to Busck that in a city noted for its dairy products good milk could not be obtained; such a city ought to abound in good milk. He thought the matter over and formed the Milk-furnishing Society of Copenhagen with a capital of about \$2,500; this firm has now a capital of \$150,000. At that time no dairies, farms, or cattle were owned by the company. They have, however, been instrumental in purifying the whole milk supply of Copenhagen and have extended their influence far into surrounding countries. Norway, Sweden, and Germany have profited by their work. They began their work in 1878. Their object was to educate the people in regard to the necessity of pure milk and to afford sanitary protection. They took as their motto, "Pure milk from sound cows." They made contracts with forty farms having altogether 5,000 cows. This contract bound the farmers to feed their milk-cows on certain kinds of fodder, to turn them out to pasture during the season, and to report immediately any ailment among cows, employees, or the family of anyone connected with the dairy. This organization guards itself not only against selling infected milk, but against selling milk that might even be under suspicion of being infected. The farms are models of cleanliness. (Dr. Boggild showed pictures on the screen of the well-groomed cattle, the farms, large and small, of the milkers, dairies, wagons, milk cans and other utensils.) Each time before milking the cattle are carefully groomed and no dry sweeping of the stables is permitted. The milkers are usually girls dressed in special costume and instructed in personal cleanliness. The milk is strained immediately after milking, poured into sterilized receptacles, cooled, and placed in a cooled chamber. The milk usually reaches the consumer before it is twelve hours old and is sold only in sealed glass bottles. The Board of Health has supervision over all milk sold. A dealer cannot go into business nor can a farmer sell milk until he has formally notified the sanitary police. There was constant supervision of the sanitary police and occasional visits of the inspectors of the Board of Health which serves to keep the dealers up to the required standard. Out of every 1,000 deaths in the city of Copenhagen in the year 1880, 219 were children under one year of age; this figure had been reduced to 198 in the year 1890. It would not have been so large had it not been for an epidemic of influenza

and diphtheria. From 1902 to 1906 the rate of infant mortality to total mortality had been only 144 in a thousand. This reduction was probably due more to the milk supply than to any other factor.

PROBLEMS OF THE DAIRYMEN.

MR. RAYMOND A. PEARSON, New York State Commissioner of Agriculture, of Albany, N. Y.—The dairy industry is not only important in Denmark, but it is an important industry in all countries where dairies exist. We have imported not only a plan of work and methods from Denmark, but have even adopted some of the sons of Denmark who are occupying permanent and important positions in this State. There are in the State of New York nearly 200,000 farms on which there are dairy cows; there are more than 1,500,000 dairy cows in the State. When one consults the dairyman in regard to the problems confronting him he tells you that the chief problem that he has to cope with is how to make ends meet. The dairy industry has not been profitable for a long time in this State. One often hears it asked why men remain on the farms and continue this kind of work. Many have given up this work and there is a decreasing number of cows in some sections. The reason more men are not giving up the work is that they have their capital invested in dairies and cannot see how they can change their occupation with their money tied up in this way. There are some farms on which a fair profit is being made, but they are not receiving a fair remuneration for the capital and labor involved. There are farmers to-day who are drawing on their capital. Again, on some farms there is a decrease of fertility. Such a condition is by no means universal, but it does obtain in some sections. Why are conditions different to-day from what they were ten years ago? The price of milk has not increased, but feed, grain, and by-products have gone up in price considerably, in some instances advancing from 50 to 75 per cent. during the last five or six years. The price of hay has doubled in a short time. The farmers are making a strong effort to increase the yield of milk that the cows are giving. They are also studying how to increase the strain of their cattle. The State of New York is rendering a great deal of aid in the problem of the treatment of bovine tuberculosis. A farmer who thinks he has a cow or cows affected with tuberculosis can, under the present law, have a State veterinarian visit and examine his cows once free of charge, in return for which service he is required to sign an agreement that he will keep his herd free from tuberculosis. The State expended \$150,000 last year in this work, and a larger sum will be available this year. The farmer has finally learned that the problem of tuberculosis is one which can never be solved until he takes an active part in the campaign. Another problem that confronts the dairyman is how he can meet the

sanitary demand now made upon him by the consumer, the physician, the health officer, and the laws made in the interest of public health. The dairyman recognizes even better than the consumer the real importance and value of better sanitation.

The work that has been done in the State of Maine is an example worthy of emulation. There it has been made a criminal offense to sell milk obtained from tuberculous cows or from cows that respond to the tuberculin test. I would like to see in this State a similar movement.

RAW MILK.

DR. GEORGE W. GOLER, Rochester.—The city of Rochester has a population of more than 200,000, receives daily 80,000 quarts of milk from 8,000 cows on 700 farms, some of which are at a distance of sixty miles from the city in three directions. A systematic attempt to control the milk supply was first made thirteen years ago under municipal direction. The effort was made to improve the entire market supply of milk. This was done by increasing the number of sanitary inspectors, by making bacteriological examinations of specimens of milk taken from the wagons at the time of delivery, and by establishing summer milk stations in charge of trained nurses where milk in bottles for infants could be obtained at cost. In 1900 more systematic bacteriological examinations were begun. A statement was issued to all dealers and producers stating that milk containing more than 100,000 bacteria per c.c. would be considered evidence that there was something wrong with the production and handling of the milk. The milk inspector is a teacher as well as an inspector. He tries to impress the producer with the elementary rules of cleanliness and sanitation in their simplest form, and he shows them that clean milk not only has an important hygienic value, but that the practical application of the sanitary regulations has a great economic value in prolonging the lives of the cattle, of making them more useful, and of securing for him a better market and a more equitable share in the profits of the milk business. We are inspecting 800 farms from two to five times annually and collect annually 3,000 samples for chemical analysis and 1,000 samples for bacteriological examination. We have for this purpose three men, none of whom were trained when they came into our service. The first man devotes his time to inspecting and scoring farms on the railroad lines. This inspector insists upon four provisions as shown on the score card. These are: 1. A drained barn and yard. 2. Not less than three square feet of light per cow. 3. Window ventilation from windows hinged at the bottom. 4. General provisions of cleanliness, of stables, cows, milkers, cans, and utensils, and a milk-room separate from the stables. He demonstrates to the farmer just how he can build such a milk-room and equip it for \$300.00, and he also shows them

how they can build a model ice-house for \$75.00. This is briefly our plan of work. The cost of this work in salaries, equipment, utensils, and traveling expenses does not exceed \$6,500.00 per annum, including the summer milk stations. During the first five years of this work the average bacterial count of 5,000 samples of milk showed that 45 per cent. of the samples contained less than 100,000 bacteria per c.c. Of the 80,000 quarts of milk received daily 6,000 quarts are pasteurized. The number of epidemics attributable to milk might be taken as a gauge of the effectiveness of the work. During the past ten years there has been one outbreak of scarlet fever, with twenty-seven cases and one death; one outbreak of diphtheria, with ten cases and one death; three outbreaks of typhoid fever, with fifty cases and five deaths. Last year he began determining how many of our dealers were selling milk capable of producing naked-eye lesions of tuberculosis in guinea-pigs. The work of collecting the milk and injecting the animals is finished, but the reacting time has not yet expired so we are not ready to report fully the results of the experiments. However, more than 20 per cent. of the cattle supplying milk to Rochester have been tested, and between one and two hundred cattle have been condemned and killed. In thirteen years, from 1884 to 1897, inclusive, when no systematic supervision was carried out, the total number of deaths of children under one year of age was 6,306; the deaths between one and five years of age were 3,304, making a total of 9,610 deaths of children under five years of age. For the thirteen-year period from 1897 to 1909, inclusive, the total number of deaths of children under one year of age was 4,641 and the number of deaths from one to five years of age 2,080, making a total of 6,721 deaths of children under five years of age. In other words, the mortality of children under five years of age has shown a diminution of 30 per cent. in the latter period. Our aim has been to raise the standard of all market milk by the methods outlined, for it has been our experience that it is better both for the producer and for the consumer to keep the milk clean.

BOVINE TUBERCULOSIS.

DR. WILLIAM H. PARK, Department of Health, New York City. —My part in this symposium is to discuss the amount of tuberculosis in man and in cattle. It requires some time before this disease can be eradicated in cattle; even in the best herds we find cases of tuberculosis. The farmer finds it a serious matter, when, say, 6, 7 or 8, or even 10 per cent. of his cattle are eliminated and he is obliged to buy more. It is almost impossible in New York State to buy cattle entirely free from tuberculosis; a certain percentage of them will become infected year by year, and this means a serious loss to the farmer. The farmer would be only too glad to eradicate tuberculosis from

among his cows if he knew how to do it. Cows with tuberculous udders are rare, but if there is one such cow in the herd she may easily infect the entire milk supply from that dairy. Dr. Theobald Smith, of Boston, has demonstrated the difference between the bacillus that causes bovine tuberculosis and that which causes human tuberculosis. Bovine tuberculosis in man is a negligible quantity. In ordinary media the bacillus of bovine tuberculosis grows only with great difficulty; that from the human being grows with great rapidity in ordinary media. There were now newer methods of determining whether one is dealing with bovine or human tuberculosis bacillus. I have some interesting charts to present, showing the number of bovine and human tuberculosis cases and other points of interest. There are 491 cases, the largest number of the pulmonary type. There was no case of bovine tuberculosis in either children or adults. Among cases of cervical adenitis there were eight cases of the human type in patients over sixteen years of age; between the ages of five and sixteen years, there were ten of the human type; under five years of age, there were seven cases of the human type and seven of the bovine type. Among the generalized cases, in adults over sixteen years of age, six were of the human type; between the ages of five and sixteen, three were of the human type and three of the bovine type; under the age of five, eleven were of the human and fifteen were of the bovine type. With meningitis, in those over sixteen years, there were twenty cases of the human type; between the ages of five and sixteen, there were eight of the human and one of the bovine type; under five years of age there were thirty-seven of the human and one of the bovine type. Of cases with bones and joints involved, in those over sixteen years, there were sixteen cases of the human type; in those between five and sixteen years, there were fifteen of the human and one of the bovine type; among those under five years of age, there were fourteen of the human type. The abdominal cases showed among those over sixteen years of age, six of the human type; between the ages of five and sixteen years, there were three of the human and six of the bovine type; under five years of age, there were four of the human and nine of the bovine type.

In a second series containing over 400 cases, there were, of the pulmonary type, in those over sixteen years of age, 278 of the human type; between the ages of sixteen and five, there were eight of the human type; in those under five years of age, there were five of the human type. Among the cases of cervical adenitis, in those over sixteen years of age there were ten cases of the human type; between the ages of sixteen and five years there were twenty-three of the human and eight of the bovine type; under five years of age, there were five of the human and twelve of the bovine type. Among generalized cases, in those over sixteen years, there were two of the human type; among those between the ages of sixteen and five, there was one of the

human type; among those under five years of age, there were thirteen of the human and five of the bovine type. With meningitis, in those over sixteen years of age, there was but one and that was of the bovine type. Where the bones and joints were involved, there was, in those over sixteen years, but one of the human type; in those between sixteen and five years, there were ten of the human type; among those under five years, there were six of the human type. In the abdominal cases, among those over sixteen years, there was one of the human type; among those between the ages of sixteen and five years, there was one of the human and one of the bovine type; of those under five years, there were three of the bovine type. These charts were from reports of German and English observers. In his own table it was shown that $1/3$ of 1 per cent. of the cases of pulmonary tuberculosis was of the bovine type. When the lymph nodes were involved, in adults 5 per cent. were of the bovine type; between the ages of five and sixteen, 39 per cent.; in those under five years, 57 per cent. were of the bovine type. Among abdominal cases in adults, 12 per cent. were of the bovine type; between the ages of sixteen and five years, 63 per cent.; under the age of five years, 75 per cent. were of the bovine type. Among the generalized cases over sixteen years there was 14 per cent. of the bovine type; between sixteen and five years, 75 per cent.; under five years, 65 per cent. In the cases of general tuberculosis, including meningitis, in those over sixteen years, there were no cases of bovine tuberculosis; between the ages of sixteen and five, there were 9 per cent.; under five, 8 per cent. In bone and joint cases, among those over sixteen years there were no cases of bovine tuberculosis; between the ages of sixteen and five, there were 5 per cent. of the bovine type; under five years, 3 per cent. were of the bovine type.

The fact should be emphasized that bovine tuberculosis is not a negligible quantity. Six-tenths of 1 per cent. of bovine tuberculosis occurs among adults, while among children there is 27 per cent. The whole milk should be heated in the homes. If this is done the milk is a safe and wholesome product. The aim is to obtain pure milk, and the question of pasteurization is one that each city should decide for itself.

DR. ROLAND G. FREEMAN.—The pictures showing the cow stables have been particularly interesting to me. It is interesting to make a comparison between what they are doing in Denmark and what we are doing in this country. The movement for clean milk started in 1878 in Denmark, while in this country it did not really begin until 1890. The idea of having the women do the milking was a great improvement. It was done in a better and cleaner manner than when men did it, and it was easier for women to keep their hands clean. As to the bacterial control of milk, any test without inspection is worse than useless.

DR. A. JACOBI.—What we have been told this evening is that the best milk is still doubtful milk. Even the so-called

certified milk cannot be called absolutely clean milk. All milk must be pasteurized if it is to be safe for infants and children; this is a fact that has been known for years. The only safety for the child of the present day is in the use of boiled milk. The milk should be put on the fire and brought to the boiling point, until it bubbles. It may then be removed. Milk prepared in this way is safe for infants and children. The only safety lies in boiled milk in this city until a better milk supply can be obtained.

AMERICAN MEDICAL ASSOCIATION.

Continued from August.

AMAUROTIC FAMILY IDIOCY.

DR. ISAAC A. ABT, of Chicago, reported a case of amaurotic family idiocy, with the autopsy and histological findings.

DISCUSSION.

DR. JOHN LOVETT MORSE, of Boston, had seen a number of these cases. He called attention to the alteration of spasticity from hour to hour and from day to day in these cases. Also, in the same line, there was a great variation in the reflexes from hour to hour. He found that most of the cases that lived any length of time developed a peculiar set of contractions. Another important point was the increased pressure in the spinal fluid. The fluid, however, was unchanged. Another thing was the curious preponderance of these cases in the Jewish race. In every case he had seen the patient was Jewish. As to the cause of death, these patients died either of marasmus or of bronchitis or pneumonia.

INTRACRANIAL SURGICAL LESIONS IN CHILDREN.

DR. CASSIUS C. ROGERS, of Chicago, in a paper on this subject, pointed out that surgical interference was justifiable in some cases of old intracranial lesions in children, and likewise discussed the class of patients suffering from retarded mental development in which surgical interference was of no value. He reported a series of cases on which he had operated with the results obtained.

DISCUSSION.

DR. EDWARD H. ABBOTT, of Elgin, Illinois, spoke of four cases on which Dr. Rogers had operated for him. Of this number, one died of surgical shock. Two showed more improvement than Dr. Rogers had given them credit for. One showed no improvement, but the younger child on whom he did a double

decompression had very little vision before the operation, and it had improved to such an extent in this short time that it could recognize food from across the room. The older child, four years ago, this child's brother, had an asymmetrically developed skull due to a unilateral hydrocephalus. Dr. Rogers aspirated the lateral ventricle in that case as well as doing a decompression operation. The time had been insufficient since that operation to judge the amount of improvement, but two of the four operated on showed decided improvement.

DR. C. GILMORE KERLEY, of New York, said that one feature of these cases of operation on the brain in children that had come under his observation recently was the indefiniteness in determining the ultimate results. He had that illustrated in one case where a baby was injured by the baby carriage falling down a series of steps and turning over, throwing the child upon the stone walk on its head. The child's skull was trephined and the bleeding vessel was ligated. The paralysis was relieved and the child made a temporary recovery. Later there developed paralysis of one side of the body, but the child developed beautifully mentally up to ten years of age, after which it developed epilepsy. He had advised a second operation. This case had impressed upon him the indefiniteness of results in these cases, for the epilepsy might develop years after an apparently successful operation.

DR. ROGERS, in closing the discussion, said that in the cases he had reported the results were not, from a surgical standpoint, satisfactory. None of the children who survived the operation had received any detriment. They were just as well off since the operation as before, and in some cases there was improvement. In every case of intracranial hemorrhage, if operated on in time, there should be a good result.

SURGICAL TREATMENT OF EMPYEMA.

DR. SAMUEL LLOYD, of New York, spoke of the conditions of the lung that were found in operations for empyema, and said that most of these were due to the pressure of the fluid. Pulmonary abscess not infrequently complicated empyema. He emphasized the importance of early operation, and stated that different operations were applicable to different stages of the disease.

Complicated apparatus to prevent lung collapse was not necessary. He described his own method of securing full expansion of the lung. The mortality depended on the time of the operation and the type of the infection.

DISCUSSION.

DR. E. E. GRAHAM, of Philadelphia, added his testimony to the operation advised by the essayist, but took some exception to what Dr. Lloyd had said as to the attitude of physicians.

He did not think Dr. Lloyd need enter his protest against the neglect of early operation, as practically all the text-books, and nearly all physicians with whom one talked were equally as ready to agree to an early operation in these cases. He did not think the change from a serous to a purulent effusion had anything to do with it. A serous effusion in a young child in a few days would become purulent. Empyema in the large majority of cases was not tuberculous. The large majority of cases of empyema in children followed pneumonia, they were pneumococcic, and this explained why they got well in the large majority of cases.

DR. ISAAC A. ABT, of Chicago, said that whenever diagnostic aspiration was spoken of, it was referred to as being very trifling, and not done early enough or frequently enough. Those who spoke of it should say that it might do harm. Diagnostic aspiration of the chest of a young infant should be done with great care and with some knowledge of the anatomic relation of things. Recently in the *British Journal of Diseases of Children* there was a report of several cases of death following puncture in young children.

As to aspiration of pneumococcus pleurisy, most of those who had tried to drain all the fluid from the pleural cavity had given it up. When the fluid was purulent he had found that the best results were obtained by incising the wall rather than in attempting to aspirate the fluid.

DR. CASSIUS C. ROGERS, of Chicago, emphasized the point that these children, which were septic to begin with and of low vitality, could be operated on, and the operation could be done very rapidly. To open the cavity and introduce a tube, using a little ethyl chloride, was all that was necessary. A general anesthetic was not essential.

DR. LLOYD, in closing the discussion, said the attitude of the physician on the question of early aspiration was true, when we were speaking to the specialist or the man who had had considerable experience; but those who were called upon to meet the average man throughout the country had found it very difficult to get the general physician, especially in the smaller places, to use the syringe at all.

As to pneumococcus infection in children under five years, he agreed that they would get well without resection of a rib. The removal of a rib was not necessary in a majority of cases. Provided the adhesions were recent and the lung capable of expansion, and there was little pneumococcic or staphylococcic infection, a local anesthetic might be used. In old cases, where the lung was held down by immense bands of adhesions, and where it could not get away and could not expand, a general anesthetic was absolutely essential, and that anesthetic should be ether.

DIETARY STUDIES OF UNDER-NOURISHED SCHOOL CHILDREN IN NEW YORK CITY.

DR. E. MATHER SILL, of New York, describes the method employed in making these studies, and spoke of the need of more

thorough instruction in the school for girls who were to be future wives, mothers, and housekeepers, as to food values, cooking, proper dietaries for different ages and occupations. He spoke of the value of instruction of mothers in the same subjects. Improper and unscientific feeding was directly and indirectly the cause of many ailments and future disability, incapacity for work both mental and physical, loss of energy, susceptibility to disease, and inability to withstand it. The greatest field for the improvement of the poor in great cities was in instruction along these lines.

DISCUSSION.

DR. WILLIAM H. WELCH, of Baltimore, in referring to the food of school children, said there was no question of the value of skim milk, but it was a serious problem to the health officer about the regulation of sales of skim milk. We could not permit the sale of skim milk where it was likely to be mistaken by the purchaser for full milk. The packages should be different or so labeled that there cannot be any possibility of mistake between the skim milk and the full milk.

DR. N. R. COLEMAN, of Columbus, Ohio, referred to the question of making the child's breakfast coffee and bread. He could not imagine anything more deleterious to a child than to give it an article that would stimulate the vasomotor centers, contract the blood-vessels, and cut off what nutrition they had, particularly cutting off the blood supply to the brain, the part of the body that developed more rapidly than any other part. Coffee, tea, and cocoa all had the same physiological effect. Another thing that he objected to was giving children prepared foods, saying it was a lazy mother's delight. There was but little nutrition in them and they were expensive. Cornmeal mush, farina, and those foods had far more nutrition in them, and were less expensive.

DR. C. F. WAHRER, of Fort Madison, Iowa, said there were three great faults of diet: eating too much, not eating enough, and eating the wrong kind of stuff. Over the first two the doctor had not much control, but he did have some control over the third. An excellent wave of reform was going over the land, and that was the teaching of girls the proper foods and the proper way to prepare them. The average physician did not realize the importance of giving out an outline of what to eat. He had a patient in his hands that he had been treating six years for nephritis, and although she was four years overdue in heaven she was still alive. He had another one, a man, who came to him for nose-bleed due to acute nephritis and, by regulating his diet, he had not had another attack of nose-bleed. When a patient was told by a physician that he must diet, he went on the theory that he must starve himself. The average doctor did not tell him what to eat and what not to eat.

DR. C. GILMORE KERLEY, of New York, said that those of us

who had seen much of life among the poor people in any large city would understand the truth of what Dr. Sill had said of the ignorance of the poor people. He had been working in dispensary and hospital work for twenty-two years, and he was impressed that it was not that those people had not enough money, but that they had no idea of what constituted nutritious food, and children were not fed with the idea of body-building, but merely of satisfying the appetite. The mothers were not lazy, but they were untaught, and that was why they would adopt a makeshift diet and do the thing that was easier. When the doctor would take the trouble to tell the mother what to do she would do it, and he knew it, for he had seen it done years and years. It was the primary function of the doctor to instruct the people how to live.

DR. S. W. KELLEY, of Cleveland, Ohio, said the child must not be allowed to starve or to go unclothed while getting its education; but the parents must be educated in their duty as parents, and he believed ultimately the duty of school boards would be confined to education. He thought they were outside of their proper function in furnishing doctors and nurses and dentists and food to the school children. This could be carried on by other organizations. He believed in medical inspection and all that sort of thing, but they should confine themselves to education and education of the parents in many ways. The physician did not wait to give instructions, but he could not see that they were all carried out. He could instruct nurses in feeding, and see that they found the people who needed them and further carry out these instructions.

DR. CATTERMOLLE, of Boulder, Colorado, said that dietetic errors were not as common in the west as among the people of the cities. The method they had adopted was to teach the girls in the high school the method of preparing food. They were taught cooking and buying of food in the market and they cooked and served it in a proper way and got up a meal for the school board or a committee.

TREATMENT OF SOME COLONIC, SIGMOIDAL, RECTAL, AND ANAL AFFECTIONS COMMON TO INFANCY AND CHILDHOOD.

DR. S. G. GANT, of New York, discussed the relative frequency of certain affections of the colon, sigmoid flexure, rectum, and anus, and their etiological factors. He outlined the least harmful and most reliable procedures. He spoke of obstipation, congenital deformities, coloproctitis, prolapsus ani, polypi, fissure, and other diseases of the anorectal region, encountered in infants and children.

DISCUSSION.

DR. LEWIS J. HIRSCHMAN, of Detroit, agreed with Dr. Gant that most practitioners had been a little more remiss in inves-

tigating rectal diseases in children than they had been in adults. It was surprising to know in how many of the little patients brought to the practitioner the importance of the examination of the rectum had been neglected. It was true that these children were brought to the rectal specialist as a last resort, but it was surprising how seldom even ocular inspection was employed by the specialist. By means of the speculum we could make an ocular examination very readily, and we could make an examination of the rectum in an infant of one year through the urethroscope. As to the comparative frequency with which we met anal fissures in young children, often a crying child that was not helped by any treatment would be found to be suffering from this condition. Again, often following infectious diseases, we would find hemorrhoids develop.

DR. C. F. WAHRER, of Fort Madison, Iowa, said he had seen men introduce a colon tube all the way up to three or more feet in length; he had seen tubes injected, the ends of which returned, and were looking out of the rectum, and gallons and gallons of stuff supposedly had been thrown into the rectum. He wished Dr. Gant would tell the members the possibility or impossibility of introducing the high rectal tube.

DR. S. G. GANT, of New York, said that all would agree that it was hard to introduce the sigmoidoscope or the proctoscope. In using the sigmoidoscope one should never use any pressure. He had known of three deaths due to trying to introduce these long stiff sigmoidoscopes. It was very easy to push through the tissues.

DR. G. S. HANES, of Louisville, Kentucky, said that a most frequent affection of the child was constipation, which was easily overlooked. There were ten cases of constipation due to irritation around the anal canal to a total of all the other causes that produced one. The next trouble frequently found was a diarrhea. The diarrheas that occurred in childhood were usually due to fermentation of food, a catarrhal condition of ulceration. Constipation and diarrhea were symptoms of other conditions. Not long ago, a child of four years was brought to him with persistent diarrhea that had lasted for fourteen months. He found that this was a case of amebic dysentery. The rectum was dotted thickly with small ulcers. He introduced the proctoscope, curetted one of the ulcers, examined it under the microscope, and found it teeming with amebæ. He had treated in the last two years more than fifty cases of amebic dysentery, most of them having come from the state of Kentucky. Of this number, six were children under ten or twelve years of age. The best method found for the treatment of amebic dysentery was ordinary coal oil. He had put in as much as half a gallon and allowed it to remain as long as possible. It was a sedative, and the patient did not have the peristalsis set up, and he could have them retain twice as much as they could of water. He had had patients return after twenty-four hours who stated that they were still passing coal oil.

As to the diarrhea, as a rule, the pathology is usually in the lower bowel and these cases could be treated through the anus. As to the position used, the patient was allowed to hang over the edge of the table on the thighs, and there was no position in which it was so easy to introduce an instrument. As soon as the patient was absolutely inverted, all the weight was taken away from the perineal floor, and all the muscles were relaxed. In a patient very emaciated, the anus would open of itself.

DR. E. H. THRAIKILL, of Kansas City, Missouri, said he had seen children with stricture of the anus that with just a little treatment of dilating would be relieved, and there would be no further trouble. As to constipation, he had seen a number of cases of this trouble due to fissure around the anus. With a very small dilator one could cure this, but the child would have for some time fecal matter remaining here and irritating the bowel, and the little patient would not have a bowel movement.

DR. GANT, in closing the discussion, mentioned the various rectal diseases that caused trouble. As to the operative treatment of diarrhea, such a measure should not be resorted to until one had tried enteroclysis and it had failed. But when one had to resort to colostomy or cecostomy, he thought cecostomy was to be preferred. The difficulty in bringing up the appendix and getting it to retain its blood supply was the chief disadvantage in doing an appendicostomy.

DR. LOUIS A. LEVISON and DR. HARRY DACHTLER, of Toledo, Ohio, presented a joint paper in reference to a clinical Roentgenographic study of the essential difference between the physical findings in childhood and adult life.

FOIBLES IN SPECIALISM.

DR. C. F. WAHRER, of Fort Madison, Iowa, said that some specialists forgot that there was such a thing as general medicine. It was too often assumed that the general practitioner did not know anything. Too many specialists too often assumed that their patients were very wealthy, and based their practice on that assumption. In pediatrics it was too often thought that infant feeding was all there was to medical practice. In infant feeding it was too often assumed that the stomachs of babies were mathematical problems, and that logarithmic tables would solve them. A specialist should not forget that the organs of the human body were but parts of the whole, united by a sympathetic nervous system. The organs not included in the purview of his specialty might also become diseased.

THE PREVENTION OF INFANT MORTALITY FROM AN EDUCATIONAL POINT OF VIEW.

DR. L. T. ROYSTER, of Norfolk, Virginia, referred to the importance of pediatrics in the medical curriculum, and spoke of the

necessity for the present-day practising physicians' better understanding of the principles of infant feeding. He cautioned against haphazard weaning and against instructing the mother, when the child was weaned, to put it on condensed milk or some proprietary food, and then to leave it to shift for itself. He spoke of the advisability of teaching mothers through various means, and especially through the medium of district nurses, what constituted the proper handling of infants and also to rely on the advice of the physician rather than the advertisements of food vendors. Mothers should be taught to abide by the best advice and not to depend upon the word of some old woman as was so frequently done.

DISCUSSION.

DR. S. W. KELLEY, of Cleveland, Ohio, said that the committee on Curriculum of Clinical Years at the Association of American Medical Colleges at its meeting in Baltimore, advanced the time devoted to pediatrics from 1,000 to 4,000 hours in the last two years. About 150 hours was the minimum requirement for a college in good standing and fit to be a member of this association. While this time allowance did not come up to the deal, it was certainly a very encouraging advance.

SUBNORMAL TEMPERATURE IN INFANCY.

DR. H. W. CHENEY, of Chicago, said that much attention was paid to pyrexia, but little notice was taken of hypothermia. There were very few recorded cases, and those were mostly fatal. Heat regulation in infants was easily disturbed. He mentioned the causes of continued subnormal temperature, and spoke of the care that should be exercised in taking the temperature and in recording it. He related the case of a three-months-old baby, which was artificially fed, and which had a subnormal temperature for four and a half months. The lowest temperature noticed was 89° F. The baby survived and gained in weight.

DISCUSSION.

DR. J. S. LEOPOLD, of New York, had seen several of these cases of subnormal temperature in infants, and the picture is what was known in America as atrophy, or what Finkelstein calls "decomposition." There was loss in weight and subnormal temperature. The temperature usually became normal as soon as the weight curve remained stationary. Frequently subcutaneous saline solution had done good and brought the temperature up to normal.

DR. GODFREY PISEK, of New York, had seen one of the cases cited by the essayist, and it was one of infantile atrophy. The

temperature was 84° . In this case all manner of expedients which were tried to increase the temperature failed.

DR. WILLIAM J. BUTLER, of Chicago, said he believed the essayist mentioned one case of tubercular meningitis that ran a subnormal temperature. He thought it was rather the exception to see a subnormal temperature in these cases, although it was often but little above normal. He recalled seeing a case of what was apparently meningitis that ran a subnormal temperature. In that case the temperature was subnormal all of the time; about 96° was as low as it went. There was dullness in the right apex. He thought it was either hemorrhage into the posterior fossa or a tubercular meningitis with subnormal temperature. Postmortem examination showed tubercular meningitis and hemorrhage into the cerebellum. In this case there was arteriosclerosis, with its associated heart change and struma of one suprarenal.

DR. FRANK GENGEBACH, of Denver, Colorado, inquired as to the condition of the pulse, the result of examination of the heart, and the appearance of the skin as regards cyanosis.

DR. CHENEY, in closing the discussion, said there was no loss in weight; that the child made a gradual gain, weighed five and a half pounds when it left the hospital. As to the heart action and condition of the skin, the pulse itself was about what would be normal for a child of that age. There was no cyanosis whatever. The skin was somewhat anemic.

The following papers were also read: "Creatinin and Creatin Metabolism in Children," by Dr. J. P. Sedgwick, Minneapolis, Minnesota; "Surgical Mistakes in Practice on Infants and Children," by Dr. Samuel W. Kelley, of Cleveland Ohio; "A Study of the Anatomic Index in Children," by Dr. Eli Long and Dr. E. Caldwell, New York.

The following were elected officers of the section: *Chairman*, DR. SAMUEL M. HAMILL, Philadelphia; *Vice-Chairman*, DR. THOMAS G. PARKE, Birmingham, Alabama; *Secretary*, DR. LAWRENCE T. ROYSTER, Norfolk, Virginia.

REVIEWS.

SHORT TALKS WITH YOUNG MOTHERS ON THE MANAGEMENT OF INFANTS AND YOUNG CHILDREN. By CHARLES GILMORE KERLEY, M.D., Professor of Diseases of Children, N. Y. Polyclinic Medical School and Hospital; Attending Physician to the N. Y. Infant Asylum; Assistant Attending Physician to the Babies' Hospital, N. Y.; Consulting Physician, New York Home for Crippled and Destitute Children; Consulting Pediatricist, Greenwich Hospital; Consulting Physician, Savilla Home, N. Y. Second edition, revised and enlarged, with twenty-one illustra-

tisons. 345 pages, Crown 8vo. \$1.00 net. New York and London: G. P. Putnam's Sons. 1910.

This second edition of a well-known book bears the marks of revision and amplification which are all in its favor. It deals with the clothing and hygiene of the infant, maternal nursing, and bottle feeding. The commoner difficulties and ailments also are described, and simple directions given for their early management. Dr. Kerley wisely avoids the introduction of prescriptions and therefore does not contribute to the tendency to home prescribing. The effect of volumes of this class upon the welfare of infants as a whole, by creating an enlarging circle of enlightened mothers can scarcely be overestimated. This one may well be put into the hands of any young mother who is anxious to undertake the care or supervision of her child with the same rational understanding of the problems which she would seek to apply to other matters of everyday life. However, while primarily written for the lay reader, it must be remembered that many questions pertaining to the child's welfare are properly discussed more fully in books of this class than in the larger text-books, and woe betides the prestige of the easy-going practitioner if he allows his own knowledge of such matters to be surpassed by the earnest mother, who is an eager reader of available popular books from the pens of acknowledged authorities.

T. S. S.

AN INDEX OF SYMPTOMS, WITH DIAGNOSTIC METHODS. By RALPH WINNINGTON LEFTWICH, M. D., Late Assistant Physician to the East London Children's Hospital; Author of "Syphonage in the Large Intestine," Fourth Edition. New York: William Wood & Company. 1910.

The thought that impelled the author to compile this book is a happy one, and he has succeeded in furnishing us with a volume that is as useful as well as unique. The author has classified all the diseases in which a particular symptom is liable to occur, so that in obscure or doubtful cases the physician may be afforded a clue to the diagnosis. By the term "symptom", Leftwich refers to both subjective and abjective signs. Among the abjective signs are included: blood, bacteria; age, occupation, duration, history, electrical reactions, reflexes, tuberculin tests, radiography, etc. Rare and some of the recently described symptoms, tests, and diseases are defined briefly, as well as those maladies associated with proper names. The work throughout reveals vast labor, and even after careful perusal the work affords a sense of completeness not often attained by other books. To our view, there is no one so situated as to be above and beyond the scope of this little work.

E. M.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Meningism of Diphtheritic Origin, the Disease being in the Nose and Mouth without False Membranes.—E. Bitot and G. Petges (*Gaz. hebd. des sci. méd.*, May 1, 1910) gives the history of a case of diphtheria without false membranes in which meningitic symptoms were present. Examination of cultures from the throat showed the presence of Loeffler bacilli. The use of the serum of Roux caused a notable amelioration of the severe nervous symptoms and a cure resulted in a case that seemed likely to be fatal. In every case of meningeal symptoms, an examination of cultures from the nasopharynx should be made to see if the diphtheria bacillus is present, since the use of serum may be of great value.

Clinical Anaphylaxis.—E. Lesne (*Ann. de méd. et chir. inf.*, Jan. 15, 1910) says that anaphylaxis means the sensitization of an animal to an organic substance by the injection with this substance. The dose sensitizes the animal so that a later dose causes marked reaction. This may be accomplished with bacterial toxins or any substance that is an albumose or approaches it in its composition. It may be done with certain mineral substances. Egg albumen will produce anaphylaxis and this will account for the bilious attacks supposed to be caused by eating eggs. The duration of the hypersensitiveness may be long, several months. The reaction consists in gastrointestinal dyspepsia, weight and wind in the stomach, constipation, or diarrhea, urticaria, etc. Milk may produce this effect in infants, and oysters and clams in some persons. Intoxication by mushrooms is another example of anaphylaxis. Not all persons are affected in this way and the author thinks that there must be a profound alteration of the digestive mucosa in such cases. Symptoms are sudden intoxication, abdominal pains, constipation, diarrhea, choleraic syndromes, fever, lessened arterial tension, and skin troubles. Cyclic vomiting of infancy belongs to this category. Experimentally, anaphylaxis may be obtained by the use of peptones and vegetable albumens. It is a state of clinical importance and allows a better understanding of some interesting phenomena which are of great severity and frequency.

Hematology of Hereditary Syphilis.—Genora Sista (*Ann. de méd. et chir. inf.*, Jan. 1, 1910) finds that in the heredo-syphilitic there is always a diminution of the number of red blood-corpuscles and a hyperleukocytosis with increase of polynuclears and lymphocytes. There is a slight increase of polynuclear eosino-

philes. Mercurial treatment soon restores the blood to its normal formula. There is no rapid and easy method of showing the existence of spirochetes in the blood.

Spasmodic Paraplegia of Heredo-syphilitic Origin in Children.—A. B. Marfan (*Ann. de méd et chir. inf.*, Feb. 1, 1910) reports a newly recognized form of spasmodic paraplegia in children, which he regards as due to hereditary syphilis. It begins at about the age of four years, and comes on slowly and insidiously. The reflexes are increased when sitting, this paralysis is not marked, but in standing the knees are kept together and there is great difficulty in bending the joints. Sensibility is normal, Argyll-Robertson pupil is present, and there is a degree of mental degeneracy combined with it. The cause of the paralysis is a lesion of the pyramidal fibers in the dorsolumbar region of a sclerotic nature. The prognosis for cure is bed. Careful mercurial treatment has no effect on the paralysis.

Functional and Anatomical Alterations of the Liver in Children.—Victor Brun and G. Bougioannini (*Arch. de méd. des enf.*, May, 1910) state that it has been demonstrated that the liver opposes a powerful defense against tuberculous infection; the action of the vascular endothelium and the hepatic cells on the pathogenic microorganisms is known and there is a remarkable delay of the action of poisons on the organism when introduced into the blood. The bacilli of tuberculosis penetrate more easily into the lymphatic vessels of the intestinal mucosa of children than of the adult. Hepatic lesions vary from cellular swelling to fatty or amyloid degeneration, cirrhosis, and acute yellow atrophy; yet these lesions are not evidenced during life by any noticeable symptoms. One of the commonest forms of cirrhosis in children is that produced by tuberculosis. The toxins alone cause a mild degeneration of the hepatic cells; living tubercle bacilli cause the production of a typical granuloma and inflammatory new formation in the connective-tissue framework of the organ. The variety of alterations depends on the intensity of the infection, the condition of the organs, and the hereditary condition of the patient.

Elimination of Iodine in the Urine in the Treatment of Tuberculous Osteoarthritis in Infancy by Iodoform Injections and their Prognostic Value.—R. Alery and C. Jourdon (*Ann. de méd. et chir. inf.*, Jan. 1 and 15, 1910) say that the medical treatment of tuberculous joints has taken the place of excision, except in cases in which there is much disorganization of the joint. Surgical treatment is not always successful, there being recurrences of the trouble in many cases, fistulæ, arrest of development of the limb in children on account of the destruction of the cartilages of the epiphysis, etc. Immobilization of the joint with modifying injections consisting of iodoform and creosote has been used successfully by the authors. They give the results in six cases in which they have observed interesting modifications of the process of elimination corresponding to the variable

clinical conditions present. They find that iodoform injected into pathological joints passes quickly into the general circulation and rapidly appears in the saliva. General symptoms of iodine absorption have never been important, diuresis has not been effected, and there has been only a slight rise of temperature. The duration of the elimination period has been very variable. In case of cavities with granulations absorption is more rapid, while in those in which fibrous formation has gone on it is slower. There were four cases out of six in which improvement or cure was obtained, and two in which little effect was observed. Iodine was eliminated in the urine and saliva in mineral and organic compounds. If elimination of the iodine is slow the process is fibroid and the prognosis is good; if elimination is rapid and in large amount, the prognosis is not so favorable.

Soy Bean in Diet of Infants.—John Ruhräh (*Jour. Amer. Med. Assn.*, May 21, 1910) says that in the feeding of infants and of some young children one difficulty is to supply sufficient protein in a form in which it can be digested and assimilated, and in these difficult and abnormal cases the soy bean would seem to have a place. A flour made from the soy bean, which is a staple food among the Chinese, contains protein, 44.64 per cent.; fat, 19.43 per cent.; cane sugar, 9.34 per cent. Each ounce of this soy gruel flour yields about 13 grams of protein and 120 calories, and it can be used 1. as a gruel, 2. in broths, 3. in making biscuits or muffins. It may also be mixed with cereals, barley jelly, cream of wheat, and the like. Leaving out of consideration its use in diabetes the soy bean may be found of benefit in the following conditions: In summer diarrheas and certain forms of intestinal disturbances a weak gruel (one or two level tablespoonfuls to the quart), made from the bean or, preferably, from the gruel flour made from the bean, will be found of great value. Barley or some other cereal should be added. Later, when the food is to be increased, condensed milk or cows' milk may be added to the soy-bean gruel. It is of value as a diluent for cows' milk when used in the strength of four level tablespoonfuls to the quart (protein 1.4 per cent.), and this may be employed with condensed milk to advantage, greatly increasing the protein of the condensed milk mixtures. When this mixture is being used an occasional tablespoonful of orange juice should be administered as an antiscorbutic. In cases of marasmus and in cases in which cows'-milk mixtures are not well borne, the soy-bean gruel may be added as a diluent of milk mixtures; and for backward, runabout children who are below *par*, the addition of the dietary of soy broth or muffins may be tried. The approximate composition and caloric value of gruels made from soy-bean gruel flour and cooking directions are given by the writer.

Practical Indications for the Food Ration of Infants.—Perier and Gaujoux (*Ann. de méd. et chir. inf.*, Mar., 15, 1910) give practical directions for the amount of food that should be given

to children. It should vary with the weight, age, and development of the child. It is as important to avoid excessive feeding as to give the child enough. The child should never be allowed to nurse for a long time, thus macerating the nipple and overfilling the stomach of the infant. It is impossible to give fixed rules for the number of minutes that should be devoted to each nursing. The amount of food should vary with the season, climate, and altitude. The case should be individualized. An infant that weighs 4 kilograms at birth and that has a nurse whose milk is abundant but weak, should be nursed longer than the child of larger weight whose source of nourishment is stronger. We may estimate the amount of milk that a child should take by multiplying the first two figures of his weight in kilograms by two. During the first seven days the amount should be increased 10 grams per day; during the first five months it should be increased 10 grams per month. Each time that the child nurses he should drink from only one breast, the other being reserved for the next nursing. The breasts are generally asymmetrical, thus entailing a difference in the quantity and quality of milk secreted. Sometimes it is necessary to dry up one breast on account of the difference of quality. It is best to encourage nursing on the smaller breast.

Constipation in Infants.—The treatment of constipation in infants is summarized by E. Pritchard (*Practitioner*, May, 1910) as follows: In all cases the exciting cause, such as deficiency or excess of food, or qualitative faults, must be treated by appropriate means. The stools may be softened by 1. free doses of petroleum emulsion, and 2. in aggravated cases by small doses of drugs which promote intestinal secretion and the outflow of bile. Inertia of the bowel may be treated by 1. massage, or massage combined with electricity, and 2. in aggravated cases by cascara sagrada and nuxvomica. In cases in which a chronic colitis complicates the condition, a preliminary course of irrigation may be employed. In cases in which the stools are light-colored and offensive, liquor pancreaticus may be added to the petroleum. In all cases regularity of habit must be enforced by careful and systematic training.

Inspiratory Murmur in Infants and Children.—H. Lowenburg (*Jour. Amer. Med. Assn.*, May 21, 1910) believes that normally in infants and children there exists a marked relative difference in the intensity and harshness of the inspiratory sound of the two sides of the chest, that on the left being louder and harsher. This difference is best noted posteriorly. He thinks that the absence of this sign on the left usually means fluid in the left pleural sac; that the diagnosis of fluid on the right and of consolidation on the left are made more difficult by this normal variation; and that unless this sign is taken into consideration the diagnosis of pneumonia on the left is apt to be made when other conditions are responsible for the fever. He says that consolidation should be suspected on the right when the sound

on this side equals in harshness and intensity that which is normal for the left, while equalization of the sounds on the two sides, that on the left being weaker than normal, usually indicates fluid on the left.

Diarrhea in Children.—J. H. M. Knox, Jr., and E. H. Schorer (*Johns Hopk. Hosp. Rep.*, 1910, vol. xv, 1) present a study of seventy-four consecutive cases of diarrhea in infants. Of these, forty-two, or 58.3 per cent., showed one of the four recognized types of the dysentery bacillus. In eleven others, or 14.8 per cent., showed dysentery bacilli associated with pathogenic streptococci. In six cases streptococcus pyogenes was the only pathogenic organism isolated. Other microorganisms pathogenic to laboratory animals and agglutinated with the patient's blood were isolated in four cases. In one case a non-pathogenic bacillus pyocyaneus alone was found, and in ten no pathogenic bacteria were isolated. Stools containing pus proved the most favorable for the isolation of the dysentery bacillus. This organism is usually confined to the intestinal tract. In the writers' autopsies it was also found once in the liver and once in the mesenteric glands. All of the 172 separate isolations of dysentery bacilli obtained from the fifty-three positive cases were found to be identical with one of the four recognized types. Organisms apparently identical with bacillus B. (Duval and Schorer), belonging to the group of "dysentery-like" bacilli, were found in two cases. Agglutination tests with the patient's blood cannot be relied upon to determine infection with the dysentery bacillus. The blood of the patient agglutinates the dysentery bacillus isolated from the same case more frequently than it does the stock cultures of the Flexner-Harris group. Other organisms found in the stools produced agglutinins in a few cases. Each member of the dysentery group studied agglutinates in highest dilution with its own homologous serum. By absorbing a serum with all but one group the specific agglutinins of that group can be more accurately determined. An organism belonging to any group will not always absorb the agglutinins of the identical groups in the different immune sera. The Flexner-Harris type of the dysentery organism has the largest amount of agglutinins common to the other members of the dysentery group. The variety which seems to be most frequently associated alone with diarrheal disorders of infants in summer is that known as Hiss and Russell's "Y," and after this in frequency comes the Flexner-Harris variety and next the Shiga type. The comparatively small number of infants infected with the original Shiga strain may partially explain the unsatisfactory results of serum treatment. Cases in which several types of the organism are present are common. The largest proportion of instances of ileocolitis and the highest mortality in any one group were noted in the series associated with more than one type of the dysentery bacillus: twelve out of thirteen cases were ileocolitis and the mortality was 69 per

cent. Next in order of severity were the cases in which streptococci were combined with dysentery bacilli: seven of eleven were ileo-colitis and 63.6 per cent. died. Of fourteen cases associated with but one type of dysentery bacillus, those with Hiss "Y" bacilli seemed most severe, six being ileocolitis and 50 per cent. ending fatally. There were no extremely ill patients among those showing unclassified dysentery bacilli of pathogenic microorganisms other than dysentery bacilli and streptococci. Of the seventy-four cases, thirty-nine had been fed on condensed milk before their illness; the remaining thirty-five, cows' milk, usually of inferior quality, or table diet. Of the former, 74 per cent. died; of the latter, 31 per cent. This tends to confirm the belief that condensed milk is useful only as a temporary expedient and if given for long periods tends to lower the resistance to disease.

Etiology of Scarlatina.—O. Casagrandi (*Lo Riforma Medica*, May 16, 1910) passed the filtrate from scarlatinal organs through a Berkfeld filter, with every precaution to make it sterile. He then inoculated the cornea of a rabbit with the filtrate. It caused an ulcer and the rabbit died from streptococcemia, the streptococcus being found also in the filtrate. The keratitis caused by the inoculation differed in several particulars from that caused by inoculation of the cornea with variola or vaccinia. When injected into dogs it caused a rise of temperature with remissions, lasting from eight to ten days, but did not kill them. After the fall of temperature the serum of the injected dogs deviated the complement of the guinea-pig in the presence of the antigens of syphilitic liver, but not in presence of the antigen of streptococcus.

Diphtheria as a Complication of Measles.—Otto Lade (*Arch. f. Kinderheil.*, Bd. 53, H. i-iii) says that diphtheria is an infrequent complication of measles, but that when it does occur it is a serious one. The prognosis is bad, and is worse the earlier in the measles the diphtheria comes on. The author examined the secretions from the throats of 112 children who had measles and found Klebs-Loeffler bacilli in thirteen. The mixed infection has very serious effects on the heart action; the type of the infection is also more severe. Whenever there is a serious condition present in measles which is not easily accounted for we should examine the secretions of the nose and throat for Klebs-Loeffler bacilli.

Epidemic Cerebrospinal Meningitis and Serum Therapy.—F. J. Sladen (*Johns Hopk. Hosp. Rep.*, 1910, vol. xv, 397) gives a detailed report of the cases of epidemic cerebrospinal meningitis observed at the Johns Hopkins Hospital, especially since the adoption of the serum therapy of Flexner. Of twenty-three cases treated with this nineteen recovered, a mortality of only 17.4 per cent. The analysis shows, by comparison with cases treated previous to the introduction of serum therapy, that the frequency of complications is reduced and that those which occur

are milder. The amount employed was usually the same as that of the spinal fluid removed. In twelve instances more serum was injected than fluid removed, but in none of these cases was there any disturbance attributable to this. As much serum as possible should be injected as early as possible, repeating every twenty-four hours in ordinary, and every twelve in severe cases. In cases in which the toxemia is apparently increased by the bactericidal influence of the first injection, subcutaneous injection of the serum may be of value, combining it with subarachnoid injections. While the serum must be applied locally in order to meet the diplococci in concentrated form, it reaches the toxins in the general circulation better by subcutaneous injection in severe infections. In the extremely sthenic cases purulent exudate and organisms are nearly always found in the lateral ventricles at autopsy, so the writer urges the intraventricular injection of serum in certain severe cases. Other local foci, metastatic or part of a general infection, may also be treated effectually by local injection of the serum. The writer favors the use of serum in all cases in which the epidemic type of meningitis is even suspected, though a second injection would be given only if something positive were found in the fluid obtained. The earlier serum is injected, the better the result. Of the twenty-three specimens of fluid, nineteen at first puncture showed some degree of cloudiness. The writer calls attention to the fact that occasionally it resembles tuberculous spinal fluid in being clear and containing a predominance of small mononuclear leukocytes. The tuberculous-like spinal fluids were seen in subacute or chronic cases. Regarding the indications for repeating the puncture and injection, the author says that continuation of the temperature or a subsequent rise without complications indicates that virulent diplococci will be found upon puncture. Delirium, stupor, vomiting, and hyperesthesia cleared up usually after one injection of serum; the headache responded to one injection in only one-half of the cases, requiring two in the others; the pains in the neck as a rule required two. When the symptoms began to clear it was with great rapidity, in three to twenty-four hours.

Cerebrospinal Fluid.—Jean Anglada (*Gaz. des. hôp.*, May 19, 1910) presents a study of the microscopic and chemical analysis of the cerebrospinal fluid in various diseases. It is generally limpid, but occasionally colored. In case of hemorrhage into the spinal canal it has a red color, varying in depth with the amount of blood effused. The cryoscopic examination is of value only where the tension is markedly increased. In a few cases the fluid contains substances which have penetrated the walls of the choroid plexus. Methylene blue and iodine appear in it in tuberculous meningitis. The Wassermann reaction is positive in the cerebrospinal fluid in most cases of syphilis and parasyphilis. In cases of syphilis of the nervous system it is always found. The normal amount of sugar in the cerebro-

spinal fluid is 0.59. In syphilis, tabes, and tuberculous meningitis it is present in normal amount. Urea is increased in nervous uremia; acetone is found in diabetic coma; bile pigments are present in some cases. There are few microorganisms that have not been found in the cerebrospinal fluid; the pneumococcus, staphylococcus, diplococcus of Hubner, coccobacillus of Pfeiffer, bacillus of Loeffler, bacillus of Eberth, and colon bacillus are rather frequent. Polynucleosis is found in the early stages of cerebrospinal meningitis. Tuberculous meningitis is characterized by lymphocytosis. Lymphocytosis is found in mumps, variola, measles, grippe, typhoid, pneumonia, pellagra, rheumatism, etc. Syphilis is dominated by lymphocytosis. Chronic meningitis has the same leukocyte formula as cerebromedullar and neuritic syphilis. In tabes and general paralysis lymphocytosis is always present. Every examination of the fluid should note appearance, density, permeability, tension, toxicity, reaction, virulence, presence of sugar, albumin, chlorides, urea, acetone, and bile pigments; cytological analysis, infectious elements and antibodies.

New Etiological and Pathological Conception of Icterus Neonatorum.—Eurica Nunci (*Rivista di Clinica Ped.*, April, 1910) bases his study of icterus neonatorum on the observation of 1,334 cases out of 4,961 treated from 1902 to 1909 in the hospital at Zurich. In most cases the icterus appeared on the second day after birth. After reviewing the various theories of the causation of icterus, and showing the short-comings of each, the author states that he wished to determine the amount of urea eliminated in the urine of the first twelve to twenty-four hours in normal and in icteric children. His results he has tabulated. The mean amount eliminated was found to be 5.02 to 3.52 per cent. Against the infectious theory of icterus it may be said that jaundice should be frequent during the first year of life if it can be caused by gastrointestinal infections, since they are so frequent. The author's investigations show that icterus does not influence in an appreciable degree the natural hemolytic power of the serum of the new-born infant. The writer studied the composition of the blood in the jaundiced new-born infant, especially the globular content and the amount of hemoglobin. He found that in the normal new-born there is a diminution of the amount of hemoglobin up to the fourth day of life, and also a lessening of the number of red blood cells from eighty-six to fifty-four million on the eleventh day. In the icteric child there is a hyperglobulia. The globular resistance of the icteric infant is above normal, and this increase in resistance is due to the jaundice. There is no urobilin, or merely a trace, in the urine of the new-born. The author studied the amount of bile pigments in the urine of the new-born, and found them present in small amount, due to the imperfect action of the renal cells which occurs in the new-born. As to the leukocyte formula, the author found that in the early days of life there is a polynucleosis, and eosinophiles are present

in varying amounts. He then studied the secretion and excretion of bile in the feces of the icteric infant, finding them greater than in the normal child. This shows the permeability of the ductus choledochus. The gall-bladder is found to be more distended in the icteric than in the normal new-born infant. All these facts are in favor of the occurrence of a polycholia in icterus of the new-born. The blood pressure in the new-born was found to be increased in amount, while in the icteric child it was decreased. The conclusion at which the author arrives as the result of all his investigations is that there is an exaggerated production of bile by the liver in the icteric new-born child, caused by a congenital insufficiency of the bile-forming function of the liver, which is not in a complete state of development. The same insufficiency is shown by the frequency of iodophilia, glycosuria, and levulosuria in the icteric new-born, and corresponds with the renal insufficiency that is often seen in the new-born.

Circulatory Failure in the Acute Infections of Children.—John Howland (*Arch. Ped.*, May, 1910; *Bost. Med. Surg. Jour.*, 1910, clxii, 627) reviews a portion of the literature showing that writers on this subject are divided into three groups. First, and by far the largest in number, were those who believed in the anatomically diseased heart as responsible for circulatory failure; second, those who believed in a functional disability due to toxins with or without anatomic change; and, third, those who exonerated the heart entirely or chiefly and held to a paralysis of the vessels from central influences. The conclusions of recent investigators appear to be: that the cause of death is a paralysis of the centers in the medulla; that this is confined primarily to the vasomotor center and secondarily to the respiratory center; that the circulation shows striking symptoms earlier than does respiration, but that respiration ceases first; that paralysis of the vasomotor center is the cause of the circulatory symptoms, and that the heart is comparatively unaffected. These conclusions are applicable to infection with the diphtheria bacillus, the pneumococcus, the bacillus pyocyaneus and the streptococcus, which organisms play a most important part in infections, medical and surgical, and also to some forms of experimental peritonitis. Only one piece of work shows any exception to the rule that experimental infections kill chiefly by vasomotor paralysis, that by Raczyński with the colon bacillus. No one is on record as having repeated or confirmed his experiments, and they stand as an exception to the rule. Of the drugs which have been used to combat circulatory failure, alcohol has been quite conclusively shown to have no beneficial effect; ether, regarded by many as the strongest stimulant, is absolutely contraindicated in a condition with a rapid fall of blood pressure. The same is true of the arterial dilators which lower blood pressure: glonoin and the nitrites. Strychnine should, theoretically, be of value, but some observers have found it without effect in

circulatory collapse unless enough is given to cause convulsions. Digitalis has no effect on the vasomotor center, acts very slowly, and simply raises blood pressure by increasing the force of the heart action. Caffein and camphor are the best central vasomotor stimulants. Saline infusions and adrenalin are of value in raising blood pressure, acting transiently by increasing peripheral resistance. Howland and Hoobler have made a series of observations on children with pneumonia, judging the action of therapeutic measures as far as possible by studying the effect on blood pressure of caffein, camphor, and adrenalin given intramuscularly. All three raised the pressure, adrenalin more promptly than the others, but its effect was evanescent, was over in less than half an hour, and in a few instances the subsequent fall was to a point below where the pressure had been before its use. Caffein preparations were uncertain, but with a good one the best results were obtained. The increase in pressure began in five or ten minutes, reached its maximum in the neighborhood of half an hour, and was manifest for two hours or more. Camphor also worked satisfactorily, but was not quite so certain or prolonged as caffein. That which raised the blood pressure more certainly, constantly, and satisfactorily than any drug was cold air. When patients were brought in from the balcony, their blood pressure fell progressively during the course of the next hour and then remained at a constant level, and indefinitely until they were put out into the cold again, when the rise again occurred. This cannot be the effect of more oxygen; it must be the reflex stimulation of the center due to the cold on the skin of the face and the nasal mucous membrane, and this view is further strengthened by the observation that cases of pneumonia treated out-of-doors do better in the cold months than in the warm. The importance of cold air as a tonic to the vasomotor apparatus can hardly be overemphasized, certain and constant and soothing. Clinical observation and animal experimentation are in accord in referring the cause of circulatory disturbance in acute infections to a failure and final collapse of the vasomotor center.

Malnutrition in Infancy and its Relation to Gastric Digestion.—The examination by L. J. Tint and L. Breskman (*N. Y. Med. Jour.*, June 18, 1910) of the gastric contents of eleven children, mostly under one year of age, without vomiting or green stools, showed a constant presence of free hydrochloric acid, rennin, and pepsin. Examination of the gastric contents of twenty children under one year of age, with green stools, vomiting, and gradual loss of weight, showed an absence of free hydrochloric acid, rennin, and pepsin. In well-developed cases of malnutrition, such an absence of gastric activity was constant and persisted throughout the course of the affection.

Limitations of Caloric Method of Infant Feeding.—H. D. Chapin (*Med. Rec.*, May 28, 1910) says that much is being written on the caloric method of infant feeding that is perhaps calculated

to give an exaggerated idea of its place and value. It has been assumed that because all animals and human beings produce and give off heat that their food requirements can be determined by the quantity of heat they excrete. No animal or person could live more than a few hours unless the heat liberated as the result of the chemical activities of the body or metabolism was excreted. It is a waste product to a great extent, and in summer time there is more heat produced than is needed to maintain proper temperature of the body, and getting rid of it then is often such a serious problem that temporary abstinence from all food is sometimes necessary to reduce the production of heat as much as possible. But in hot weather, when the heat produced is more than is needed to keep up the temperature of the body, the number of calories excreted is not an indication of the food requirements from the standpoint of heat value. From the heat-producing standpoint, coal, gas, wood, meat, fat, sugar, and cereals are equally valuable, as all will burn and produce heat, but that the heat they are capable of producing is an indication of their food value, or that they are interchangeable according to heat values is at once seen to be absurd. Foods that are of equal heat-producing value, and which are also digestible, are not interchangeable for different individuals, and growth and tissue repair do not depend upon the storage of heat, but upon the assimilation of protein. In infant feeding, particularly, where growth or the storage of protein is the chief phenomenon of nutrition, the main point to be considered is not, will the food supply heat, but, is it capable of causing growth? The amount of food to enable growth to be made cannot be determined by the amount of heat excreted. It is self-evident, then, that the caloric method is not one that readily lends itself to successful infant feeding, whatever value it may have in the feeding of adults. But for roughly comparing the heat values of mixed diets, which prove to be suitable for the particular case from the digestive standpoint, when the composition and weights of the foods eaten are known, and also to act as a sort of check, the caloric values of the foods may serve a useful purpose. The usual percentage system as applied in this country gives a very close approximation of the caloric needs as they have been worked out.

Gastric Analysis in Infants.—D. H. Sherman (*Jour. Amer. Med. Assn.*, May 7, 1910) has examined the gastric contents of a number of infants one-half hour after a meal of barley water and also after a meal of proprietary food containing starch. In the barley-water series, omitting five infants nine months or more of age who presented a very high acidity, he found, in thirty-seven cases, free hydrochloric acid, 2.1; total hydrochloric acid, 5.6; total acidity, 9. Among children with sour vomiting eleven analyses after barley water showed free hydrochloric acid, 4; total hydrochloric acid, 10.3; total acidity, 15.8. The total acidity after the meal of proprietary food in the vomiting series, was 18.2 while in normal series it was 17.4. The writer concludes that

hyperacidity is one of the common causal factors of the vomiting of infants. Clinical experience showed that longer intervals of milk-feeding are less apt to be followed by sour vomiting. Milk going into a hyperacid stomach forms curds more quickly, they are larger and harder, and hence may produce vomiting. The analyses explain the good results following the exclusion from the dietary for a time of cow's milk, the reason for gastric rest, with or without lavage, and also the chemical antidotal effect of alkalies.

Rheumatism in Childhood.—J. R. Clemens (*Arch. Ped.*, May, 1910) has so frequently observed an enlarged thyroid in rheumatic children that he claims for it a place as a sign of rheumatism when occurring before puberty.

Investigations of the So-called Sodium Chloride Fever and of Chloride Excretion in Nurslings.—Ragnar Freiburger (*Arch. f. Kinderheil.*, Bd. 53, H. i-iii), following the publication of Schlapp's investigations in this line, made eighty-three tests in twenty children at the Klinik at Dusseldorf. Schlapp found that subcutaneous injections of sugar or sodium chloride produced fever in many children, which varied in height of temperature with the amount of the material injected, and the condition of health of the child. Of the twenty children used by the author for his tests, four were healthy, four had eczema, and twelve had gastrointestinal troubles. The author found the fever to be of regular type; the temperature began to rise four to six hours after the injection; its fall was irregular during twelve to thirty hours; the temperature reached 38° to 38.8° . There was some restlessness; in one child the stools were watery and frequent. The reaction occurred twenty-six times out of the eighty-three injections, and occurred in twelve children, the other eight showing no rise at any time. The reaction was very irregular, depending on the amount of salt used in the solution. In well children there was no reaction to 60 c.c.; the same was true of the eczematous children; among those suffering from gastrointestinal troubles a small amount of solution brought about a reaction, and general symptoms were somewhat marked. These children were all nursing. When sodium chloride tea was administered by mouth no reaction took place. The author also examined the excretion of sodium chloride after ingestion or injection of considerable amounts of salt solution in eight children, two healthy, three having eczema, and three gastrointestinal troubles. Urine and feces were both examined. Salt was administered during two days; salt taken by mouth was more quickly eliminated than when injected. Elimination of salt was slower in the sick children than in the well ones. Slow elimination has some influence on the production of fever from salt injections through retention of sodium chloride in the body. Meyer brings forward the theory that the injection causes changes in the mineral content of the cells by catalysis producing substances that cause fever.

Open Operation for Congenital Luxation of the Femur.—

B. M. Ricketts (*N. Y. Med. Jour.*, June 4, 1910) states that the open operation is applicable to all cases after the third year. One or both heads may or may not be removed. The head may be held in place by means of a screw or nail or by an osteoplastic flap as suggested by Ferguson. The dangers such as fracture, hemorrhage, tetanus, paralysis, and shock incident to reduction by the unopen method are all avoided by the open method. The percentage of imperfect results such as redislocation, ankylosis, shortening, and a pendant member are no greater with the open than the unopen operation. The prone position should be maintained for not less than 100 days, at the expiration of which the erect position should be assumed with crutches and an elevated shoe upon the opposite foot. Anteroposterior motion of the artificial joint should be begun at the expiration of 125 days. The body weight should not rest upon the affected limb until after the one hundred and fiftieth day. The use of extension braces is seldom if ever indicated with a unilateral artificial joint with or without the absence of the head. They may, however, be used advantageously in bilateral artificial joints with or without the absence of the heads. Muscular function of the leg should be restored as soon as possible by use and massage.

Errors in the Search for Gonococci in Vaginitis of Children.—

Ira Van Gieson (*Med. Rec.*, June 11, 1910) calls attention to the frequent failure to detect gonococci when the dry cotton swab is employed to make a smear from the vagina of a child. Unless the discharge is profuse, the exudate on the absorbent cotton is caught in its interstices, and the result is that much of what we wish to have on the slide is retained by the cotton. Not infrequently in thin, serous, and scanty discharges nothing but fluid is expressed from the swab to the slide, while abundant gonococci remain in the leukocytes sticking tenaciously within the meshes of the cotton fibers. The exudate often spreads unevenly, so that the cells are heaped or crushed. The introduction of a dry cotton swab into an inflamed vagina must injure its walls somewhat, just as it would in the male urethra. A very much better way to obtain the exudate is to collect it in glass tubes so that one can see what the content of the vagina is, and incidentally not lose it in transferring it to the slide. For this purpose ordinary medicine droppers are the most convenient; they are about the length of the average child's vagina and manipulation of the rubber bulb collects the secretion. Occasionally the sharp cutting edge of the dropper needs rounding off in the flame. The tubes may be sterilized and used over again, kept in bichloride solution before being applied, and the children are hardly aware of their introduction. Sometimes the pus is so scanty that instead of filling the lumen of the tube it sticks to the sides of its walls and cannot be transferred to the slide. In such instances it is well to fill the tube with a drop or two of water, or, better, a 1-5,000 bichloride solution before intro-

ducing into the vagina, and by compressing and expanding the bulb make an emulsion of the exudate. The advantage of this is that the whole vaginal contents are obtained where the secretion is scanty, the bichloride fixes the cellular elements at the same time, and they are in perfect form when dried on the slide. Exceptionally in very young children, or where the vaginal entrance is very small, it is necessary to draw out the tubes to a finer caliber, although when partly filled with the bichloride solution they need only be inserted into the ostium and the exudate washed out into their lumen.

Joint Tuberculosis.—L. W. Ely (*Surg. Gyn. Obst.*, June 1910; *N. Y. State Jour. Med.*, June, 1910; *L. I. Med. Jour.*, June, 1910) states that only two tissues in a joint, the synovia and the red marrow, are subject to tuberculous disease. He says that in bone tuberculosis, the only tissue that is affected directly by the disease is the marrow, and in the marrow the disease spreads, not in the ordinary yellow or fatty marrow found in the shafts of the long bones, but in the red marrow of their cancellated ends (as also in the red marrow of the vertebræ, the short bones, the sternum, the ribs, and the cranial diploë) hence in the long bones always in the vicinity of the joints. Exactly what the character of the cells is that makes the red marrow a field for the spread of the disease is unknown; but the writer asserts that where this marrow is found in bone the bone is subject to tuberculous invasion; and where it is not found, there the bone is immune, or almost immune, to a purely tuberculous infection. Any operation that causes the epiphyses of the long bones to lose their cancellous structure and to become compact bone, that is, any operation that causes the marrow to change from the red or cellular variety to the yellow, will cause the disappearance of the disease at that spot. We say of the synovial membranes that any operation which deprives them absolutely of function causes them to lose their distinctive structure, and to change to fibrous connective tissue and hence cures the tuberculous disease in them. After a resection of the knee, if ankylosis be obtained, the portions of the epiphyses left behind gradually lose their cancellous structure, and the marrow in them changes from red to yellow. The femur and tibia became one bone, and in course of time a regular medullary canal is established through the entire shaft. In knee-joint resections, instead of removing two inches of bone, and exposing the patient to a long and exhausting operation, the writer favors simply opening the joint and removing enough bone to secure ankylosis, paying no attention to the tuberculous tissue left behind, for he claims that it will shrink and disappear when the joint has been destroyed. A mere shaving is removed from the apposed surfaces of femur and tibia, simply enough to secure ankylosis and so destroy the function of the joint, motion.

Tranfusion as a Cure for Melena Neonatorum.—To the two cases reported as successfully treated in this manner by S. W. Lambert and by Swain, Jackson and Murphy, H. O. Mosethal (*Jour.*

Amer. Med. Assn., 1910, liv, 1613) adds a third. Both parents were healthy and the family history contained no record of any blood disease or syphilis. Labor was normal but apparently two weeks premature. On the third day, five hours after nursing, the child vomited blood and a few minutes later passed a bloody stool; the vomiting was not repeated, but the bloody stools continued until eight hours later when the infant was almost exsanguinated, as shown by its very marked pallor; the pulse was weak, beating 180 to the minute; the only other signs of bleeding were found in a hemorrhagic area covering the left half of the hard palate, and punctate hemorrhages in the remainder of the hard and soft palate. Transfusion was performed by A. Carrel; the child's color changed to normal and except for an additional bloody stool, which evidently was contained within the intestine at the time of the transfusion, there was no further occurrence of hemorrhage; the baby nursed well and gained weight rapidly; up to one year after the birth of the child, there had been no recurrence of the bleeding.

Experimental Poliomyelitis in Monkeys.—Continuing their experiments, Simon Flexner and P. A. Lewis (*Jour. Amer. Med. Assn.*, 1910, liv, 1780) have endeavored to produce active immunity in monkeys by intracerebral injection of a filtrate prepared from the spinal cord of a recently paralyzed animal, and passive serum protection by injections of blood serum of children who have recovered, and also to produce a neutralizing serum in the horse by repeated injections of a virulent filtrate. They found 1. that if the quantity of virus injected into the brain eighteen to twenty-four hours before the serum treatment is begun is not in excess of a given dose, the action of the virus can be prevented; 2. that the infection of the meninges from the nasal mucosa can also be prevented by the serum injections; 3. that normal monkey serum has no such restraining effect; and 4. that the horse serum is entirely without preventive action and tends rather to hasten the onset of paralysis. In view of the fact that the virus of poliomyelitis can enter the nervous system through the abraded mucous membrane of the nose, the writers have tested the effects on the virus of hydrogen peroxide and some other disinfecting agents. The virus is quickly destroyed by a dilution of perhydrol containing 1 per cent. of hydrogen peroxide.

Arthrodesis and its Application in Infantile Paralysis of the Foot.—Arthrodesis is defined by W. R. Macausland and B. E. Wood (*Bost. Med. Surg. Jour.*, 1910, clxii, 853) as an operation, the object of which is to stiffen joints not completely or not at all under the control of normal muscle groups. It should never be done until after the age of twelve years. The operative technic is as follows: The patient is prepared in the usual aseptic manner, from toe to knee inclusive. The operation is better done with a tourniquet. A semicircular skin incision is made, beginning between the prominence of the external malleolus

and Achilles tendon, passing one-half inch below this malleolus forward to a corresponding distance in front of the external malleolus. The skin flap is then dissected upward. The extensors of the little toes are pulled forward and the peroneal tendons pulled backward. A similar incision is made through the ligamentous and capsular covering of the ankle-joint, exposing the tibia-astragaloid joint. The foot is then inwardly dislocated. Too great a force should not be used, as fracture of the tibia tip has been known to result. After the ankle-joint is thus dislocated the surfaces of the tibia, fibula, and astragalus can be denuded of cartilage. Often other joints in the foot, as, for instance, the astragalo-scaphoid, have to be similarly treated when they are involved in loss of muscular and ligamentous control. The principles of procedure are the same. The dislocation is then reduced, thereby bringing the denuded surfaces together. To accomplish this result the fibula tip is fractured by subcutaneous osteotomy and pressed in closely in the application of the plaster.

One of the writers has changed this procedure in a single case and the result seems to be favorable. Feeling that the tibia and fibula should be left in normal relation, the astragalus was split longitudinally to accomplish the same result. It is hoped this will accomplish two things; give good approximation between the tips of the tibia and fibula and also produce excessive callous formation.

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SOME NEGLECTED PRINCIPLES IN THE CAUSATION
OF MENSTRUAL DISORDERS.

BY

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PERHAPS the most conspicuous physiological phenomenon associated with the reproductive organs of the female is menstruation, and certainly the most important symptoms of disease of these organs are those involving some disturbance of this function. With perhaps a few exceptions, a study of the many possible variations of these symptoms will in itself seldom be more than merely suggestive. Much of contributory value, however, may often be learned by such an investigation, although a careful physical examination is, of course, usually indispensable in the establishment of a correct diagnosis. With pain and leukorrhea, the various disturbances of menstruation make up practically the entire array of local subjective symptoms of pelvic disease, but, like pain and leukorrhea, it must be borne in mind that, after all, they are only symptoms and not disease entities, and hence that any rational treatment of these symptoms must be directed toward a treatment or removal of the underlying cause.

In this brief paper it will not be my object to take up in a categorical manner the causes of all the various menstrual disturbances and their appropriate treatment, but merely to select from this broad and fertile field for discussion a few interesting questions which have impressed me either by their

innate importance or by the fact that they have not as yet received from the profession the attention which they seem to merit. In the consideration of the various pathological disturbances of menstruation it would seem that a clear conception of the normal physiology of the process is essential. Concerning this, however, there is still much that we do not know. While we are familiar with the periodicity of menstruation, we are still, in large measure, ignorant of the factors which regulate or disturb this periodicity; while we are cognizant of the fact that there are wide variations in the amount of flow in different women or perhaps of the same woman at different times, it is oftentimes difficult or impossible to explain these variations; and although we may speak learnedly of the causes of painful menstruation, how frequently do we meet with cases which impress us with the meagerness of our knowledge in this respect!

Commencing with our fundamental conception of normal menstruation, it seems to me, in the light of recent investigations upon this subject, that there are three factors to be considered in its physiology: 1. An underlying cause, as yet undetermined, to which is due the occurrence and periodicity of menstruation; 2. the characteristic vasomotor phenomena which affect the pelvic blood-vessels; 3. the histological modifications of the endometrium which correspond to the various phases of the menstrual cycle.

As to the underlying cause of the menstrual process, there have been many conjectures, and even now the matter is far from being definitely settled. Without going into detail, and avoiding at the present time any discussion of real or apparent exceptions, suffice it to say that the occurrence of menstruation seems in a general way to be dependent upon the presence of ovarian tissue. It was the custom in former days to explain the influence of the ovary in the causation of menstruation as being exerted through the medium of the nervous system, although, as far as I am aware, no satisfactory explanation has ever been given of the exact manner in which this nervous influence is exercised. That the nervous connections between the uterus and the ovary are not essential to the occurrence of menstruation would seem to be indicated by such experiments as those of Knauer, Marshall and Jolly, and others, in which menstruation persisted even when the ovaries were removed and transplanted to a distant part of the body. Such

facts as these lend much weight to the now widely-accepted belief that the activity of the ovary in this respect is dependent upon chemical rather than nervous influences. According to this idea the occurrence of menstruation depends upon an internal secretion, or, as Starling calls it, a hormone, produced by the ovary. The activity of this hormone is manifested most conspicuously by vasomotor phenomena affecting the pelvic blood-vessels and producing the pelvic hyperemia characteristic of the process. In the light of recent discoveries concerning the varied activities and interdependence of the organs which possess internal secretions it is scarcely probable that this is the only function of the ovarian hormone or hormones, but it is certainly the most prominent and the one most directly related with the menstrual process. Like other hormones, or chemical messengers, the hormone of the ovary is transported by the blood stream, and it is conceivable that its effect is produced either through the vasomotor center in the brain or, more probably, through the centers in the spinal cord. That the effect may not always be confined to the pelvic blood-vessels would seem to be indicated by the occasional occurrence of the phenomenon of vicarious menstruation, with its accompanying hyperemia affecting vascular areas perhaps far removed from the pelvis.

Whatever part of the nervous system is involved in the production of the menstrual phenomena, there are numerous clinical evidences that it is quite apt to reflect the general condition of the body as a whole, that it is bound up with greater or less intimacy with other parts of the nervous mechanism, and that it is quite likely to be readily affected by exogenous influences. It is a matter of common knowledge, for example, that amenorrhea occurs quite commonly as a symptom of such systemic conditions as anemia and tuberculosis. Within the past year I have observed two cases of incipient tuberculosis of the lungs in which the patients, both young women, neglected almost entirely the slight cough and other pulmonary symptoms, and sought advice on account of the amenorrhea which had developed. In such cases as these the amenorrhea is presumably the result of an inhibitory effect of the tuberculous process upon the vasomotor centers through which the ovarian hormone produces the vascular phenomena of menstruation. That the effects of such diseases are not by any means specific may be inferred from the fact that in these very same affections menor

rhagia is occasionally noted instead of amenorrhea, although in the case of tuberculosis it must not be forgotten that the excessive menstruation may be due to a local tuberculous involvement of the pelvic organs.

The effect of profound nervous influences upon the menstrual function is further illustrated by the frequent occurrence of amenorrhea, less commonly of menorrhagia, in connection with the various forms of insanity. This Krafft-Ebing explains as due to "disturbances of the vaso-motor innervation," and Church and Peterson as due to "profound changes in the general nervous system influencing the spinal centers for ovulation and menstruation." Furthermore, as Ehrenfest points out in his recent exhaustive paper upon the subject, even a slight or only temporary improvement in the mental condition of such a patient is often characterized by a rapid restoration of the menstrual function to normal, thus precluding the possibility of the disturbance having been due to any organic change in the uterus. This latter factor can also be excluded in the amenorrhea which occurs in unmarried women who have a fear of pregnancy or in married women who are very anxious to bear children.

Even more interesting and suggestive are the menstrual disturbances which are so frequently noted in connection with tumors of the brain, especially those in the region of the pituitary body. It seems to have been shown by Cushing and others that a frequent manifestation of diminished secretion of the hypophysis cerebri, more especially of its anterior lobe, is a dystrophy of the genital organs, and, in women, the occurrence of amenorrhea. It is interesting to note that another prominent symptom of the same condition is the development of adiposity—interesting because of the well-known frequency with which amenorrhea and obesity are associated clinically. It is rather difficult to conceive that the condition of adiposity can be produced by the amenorrhea in itself, and so the question arises, is the amenorrhea the result of the obesity or are both the results of a common underlying cause? While this question, in the present state of our knowledge, cannot be definitely answered, such observations as those just mentioned make it seem highly probable that the pituitary hormone or hormones are directly or indirectly concerned in this association of symptoms. There is another fact which lends weight to this view. It is a well-known fact that the menopause, especially when

prematurely induced through surgical means, is often characterized by a considerable deposition of adipose tissue, ostensibly as a result of the withdrawal from the system of the ovarian hormone. The fact that a similar increase in weight is seen in connection with a disturbance of the hypophyseal function is highly suggestive of the close inter-relation existing between these two bodies. As yet the observations along this line have been confined almost entirely to cases of profound disease of the hypophysis, especially tumor formation, but it is only natural to suppose that many menstrual disturbances are the result of less severe disease of the gland, perhaps of only a functional disturbance which causes no intracranial symptoms whatsoever. The analogy with the pathologic physiology of the thyroid will readily suggest itself. Not only the pituitary body, but also a number of other organs which possess internal secretions are closely related with the functions of the generative organs, as has been shown in a previous paper, and it is by no means a fanciful assumption that many of the numerous cases of menstrual disturbance of unknown origin are to be explained by alterations in the functions of these related organs. The problems involved in this broad question, it seems to me, offer perhaps the most alluring and profitable field for work in the physiology of the female reproductive organs, and their gradual evolution and ultimate solution will draw back the obscuring veil from many matters concerning which we are as yet entirely ignorant.

As has been already stated, the vascular phenomena in the pelvis constitute perhaps the most prominent manifestation of the menstrual process. If the pelvic blood-vessels be already, as a result of inflammation or other cause, overfilled with blood, the additional effect of the menstrual process is quite likely to produce a condition of extreme engorgement, with resulting menorrhagia or metrorrhagia. Again, if the blood-vessels of the uterus be the seat of arterio-sclerotic disease, it seems quite possible that uterine hemorrhage may result, either on account of the inability of the diseased vessels to contract or on account of actual rupture—an "apoplexia uteri" comparable to apoplexia cerebri. Great stress has been laid upon this factor by Reinecke, Rees, Barlow, and others. As Shaw has pointed out, however, such sclerosed vessels are to be found also in women with perfectly normal menstruation, while no one has ever observed an actual rupture of such vessels which

could account for the hemorrhage. While, therefore, it seems probable that in a certain number of cases uterine bleeding may be due to arteriosclerosis, too much stress should not be laid upon the etiological importance of this factor.

More promising seems to be the theory of Theilhaber, who attributes to the mesometrium an important rôle in the regulation of the pelvic circulation. It is a well-known fact that in many cases of menstrual disorder no pelvic lesion can be found, while curing of the uterus yields a normal endometrium. Especially characteristic and especially perplexing is this in many instances of uterine hemorrhage, perhaps of an intractable nature. In view of this fact, it is not surprising that the attention of gynecologists is no longer confined to the endometrium alone, and that much study has of late been given to the influence of alterations in the other coats of the uterus in the production of uterine bleeding. According to Theilhaber a large proportion of cases, especially of the preclimacteric variety, is due to what he speaks of as "*insufficiencia uteri*," meaning by this a relative insufficiency of the muscular tissue of the uterus as compared with the fibrous tissue. This condition, he believes, results in a stagnation of the uterine circulation, with the production of menorrhagia or metrorrhagia. A number of objections have been offered to the theory of Theilhaber, but there can be little doubt that it explains the occurrence of uterine bleeding in at least a limited number of cases.

Finally, we have left for our consideration the third factor in the production of menstrual disorders, *i.e.*, changes in the endometrium itself. In the microscopic diagnosis of lesions of the endometrium many erroneous conclusions will be arrived at unless one is thoroughly familiar with the normal histology of the uterine mucosa and especially with the physiological variations which it undergoes at different phases of the menstrual cycle. The study of this "menstrual histology" of the endometrium, so to speak, was up to very recent times in a condition of great imperfection. Within the past few years, however, an important contribution to our knowledge of the subject has been made by Hitschmann and Adler, who from the study of the uterine scrapings from fifty-eight cases at different phases of the menstrual epoch were able to describe certain histological appearances characteristic of each stage. These observations Dr. W. S. Gardner and I have been able, in the main, to confirm as a result of the study of fifty cases along exactly the

same lines, as was detailed in a paper presented before the Section on Obstetrics and Diseases of Women of the American Medical Association at the annual meeting of 1909.

Such studies show that at the height of the menstrual flow the mucosa diminishes in thickness, the glands pouring out their secretion and becoming straight and collapsed. After the period there begins a building-up process involving the epithelium, glands, and stroma, so that by about the fifteenth day the glands, which exhibit the most characteristic changes, have become considerably larger and often somewhat tortuous and corkscrew-like in appearance. The most striking change, however, takes place about six or seven days before the onset of the next menstrual flow, being characterized by a rapid enlargement of the glands with an increase of their tortuousness, while the epithelium becomes swollen and the gland lumina filled with mucus. These gland changes are much more marked in the deeper portions of the mucosa than in the superficial, so that there is produced a differentiation into a superficial compact and a deep spongy layer, as in the case of young decidua tissue. The resemblance is further increased by the fact that the stromal cells also in many cases undergo decided modification, becoming larger and richer in protoplasm, so that in some cases they are with difficulty or not at all distinguishable from true decidua cells. The endometrium, therefore, presents a constantly changing histological picture, the entire menstrual cycle being from this standpoint, according to Hitschmann and Adler, divisible into four stages: postmenstrual, interval, premenstrual, and menstrual.

The importance of such studies to a proper conception of the physiology and pathology of menstruation is apparent. The great advances which have been made in pathologic anatomy in recent times have imbued gynecologists with the anatomic idea in explaining pelvic diseases and symptoms. After curetting the uterus, as is so frequently done for the cure or relief of the various menstrual disorders, especially uterine bleeding, earnest and sometimes far-fetched efforts are often made to find in the microscopic picture some explanation of the clinical symptoms. Many fancy and some fanciful pathological diagnoses are thus lamely propped up in a feeble effort to mask an ignorance which is not actually culpable unless so concealed. As has already been emphasized, there are many cases of menstrual disturbance in which no gross pelvic lesion exists and in which

the endometrium may be found normal in every way. This fact, however, should not deter one from resorting to careful routine examination of the scrapings in every case of uterine curetting, for in no other way can one be certain that important causative conditions are not being overlooked. Especially true is this in cases of suspected carcinoma, as will be emphasized later.

In the light of our new knowledge concerning the "menstrual histology" of the endometrium, we now know that what was formerly diagnosed as glandular endometritis is in the vast majority of cases nothing more than the physiological gland change which occurs just before the menstrual flow. In the same way, the appearance which has often been described as interstitial endometritis we know now is frequently the normal appearance of the premenstrual endometrium in its superficial compact layer, while in cases in which in former years the diagnosis of pregnancy would have been made from the mere presence of decidual cells such a diagnosis would not now be ventured, knowing as we do that other influences than pregnancy may produce the overgrowth of the stromal cell which converts it into the so-called decidual cell. It must not be inferred from what has been said that there is no such thing as a true endometritis, for of this there can be no doubt. But it cannot be too strongly emphasized that a diagnosis to this effect must be based upon the same criteria as a similar diagnosis in other tissues, *i.e.*, hyperemia, leukocytic infiltration, and edema in acute inflammation, and small round-cell infiltration, possibly fibroblast formation and, according to Hitschmann and Adler, the presence of plasma cells in chronic inflammation.

This leads us to the consideration of the question of the value of curetting in the treatment of the various menstrual disorders, especially uterine bleeding. The causes of this latter condition are many and various, but from our standpoint they may be divided into those in which there is an actual structural alteration in the endometrium and those in which the endometrium is normal in its microscopic appearance. It is, of course, often difficult or impossible to say to which group a given case belongs until after the operation has been performed, and hence it has generally been accepted that curetting is a proper method of treatment in all those cases of intractable hemorrhage of "idiopathic" origin, *i.e.*, those in which there is no discoverable cause. To this custom there would seem to

be no valid objection. It is the practice of not a few gynecologists, however, to resort to this operation repeatedly in such cases, even though the removed endometrium shows no pathological change whatsoever, and it is with this method of treatment that issue may perhaps be taken. It seems very illogical to subject the uterus to repeated curetting when the microscopic examination shows the mucous membrane to be normal in every way. How irrational it would seem, in a case of vicarious nasal menstruation, for example, to scrape away—to repeatedly scrape away—the normal mucous membrane of the nose in an effort to cure the condition. And yet the comparison is by no means a far-fetched one. As to a really rational treatment for these cases of intractable uterine hemorrhage I shall not presume to offer any suggestions, and, indeed, it seems unreasonable to hope for much progress along this line until we learn more concerning the real cause or causes of such conditions.

Aside from inflammatory disease of the endometrium, there are of course, a number of other lesions which are more or less closely related with menstrual disorders of one form or another. It is easy, for example, to understand how a malignant growth may give rise to uterine bleeding, or how a uterine polyp may cause both bleeding and dysmenorrhea; nor is it difficult to understand that a marked displacement of the uterus may be associated with some form of menstrual disturbance. There are two conditions, however, both characterized by menstrual irregularities, which deserve especial emphasis on account of their gravity and the frequency with which they are overlooked. I refer to ectopic gestation and carcinoma of the uterus. Perhaps the most suggestive symptom of extrauterine pregnancy is a slight but persistent metrorrhagia, often succeeding a period of amenorrhea during which the patient considers herself pregnant. In perhaps the majority of cases the significance of this bleeding is not realized and a condition of the greatest gravity to the patient is thus overlooked until, perhaps, too late to save life. If not entirely overlooked the condition is quite likely to be mistaken for something else, most likely for incomplete abortion, and treated by curettage, a procedure which in such cases as these is associated with considerable danger.

In carcinoma of the uterus, again, it is some irregularity of menstruation, usually menorrhagia or metrorrhagia, which

first directs the patient's attention to the possibility of some pelvic trouble, and if she be one of the fortunate minority who do not attribute such irregularities to the "change of life," it is these symptoms which lead her to seek medical advice. The vital importance of impressing upon womankind the danger of neglecting menstrual disturbances at or near the menopause, and the means through which such information may be disseminated, is one of the big tasks before the profession to-day, and the vigor and intelligence with which the problem has already been attacked is sure to be reflected ere long in a marked lessening of the mortality from this scourge.

From this imperfect, and, I fear, somewhat disconnected survey of some aspects of the etiology of menstrual disorders it would seem easier to deduce a general principle than to draw any sharply defined conclusions. It may, therefore, in conclusion be emphasized that in the treatment of menstrual disorders an effort should always be made to ascertain the cause of the disturbance, and, in searching for this cause, due regard must be paid to perversion of physiological function as well as to alteration of anatomic structure of the reproductive organs. The present period of surgery has been spoken of as the physiologic era, to distinguish it from the preceding anatomic era, during which, probably as a result of the high degree of development of the science of pathologic anatomy, the explanation for most ailments was sought in tissue alterations, detectable with or without the microscope. Happily, surgeons are now awake to the fact that a proper knowledge of pathologic physiology is just as important a requisite in diagnosis and treatment as is a familiarity with pathologic anatomy, and it is remarkable what hidden truths have been unearthed by the sedulous search of the modern surgeon in physiologic domains. After the fashion of the alchemist of old, the abstract physiological truth, by contact with the practical need of surgery, has been converted into the precious material of which surgical progress is made. In no branch of surgery are there to be found greater possibilities for advance along physiological lines than in gynecology, and it is to such advances in gynecological physiology that we must look for an explanation of the now unknown causation of many disorders of the menstrual function.

AN IMPROVED AND PERFECTED OPERATION FOR
THE RELIEF OF EXTREME CASES OF PROCI-
DENTIA, CYSTOCELE AND RECTOCELE.*

BY

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(With six illustrations.)

ALTHOUGH I have never presented to this Society any formal paper upon this subject, many of you are more or less familiar with my work in endeavoring to construct a perfected operation for the serious and annoying condition set forth in the title of my paper. This, as I am sure you all recognize, has been a most difficult condition to relieve, and while many of the best minds in our specialty have given much time and serious attention to it, no procedure has emanated from their hands that has given permanent or satisfactory results. As one of our number, after sitting at my elbow two or three years ago and witnessing two of my operations, remarked: "I have long felt that about all the problems in gynecology have been satisfactorily solved by us except this one of cystocele and procidentia. I am convinced now that you have hit upon the right principle and solved the problem."

As for myself, while following in the footsteps of our great teachers and witnessing the failures that were on every hand as the result of the work of all operators, I have long felt that the failure lay in the fact that the fundamental principle of those procedures, one and all, was wrong. This principle was the teaching that the support of the pelvic organs was below the organs and resided in the floor of the pelvis. A flood of light was shed upon the situation when I grasped the fact that the principle invoked by nature to hold the organs of the human body in place is suspension from the bony frame work by ligaments. It has been my constant effort, therefore, through these years of study of this condition, to shift the idea of support in the pelvis, from the perineum to the liga-

* Read at the Meeting of the American Gynecological Society held in Washington, May 3, 4, and 5, 1910.

ments, and in the procedure that I have devised, call into play that principle of support from above. One gets the first intimation of the practicability of this principle when he considers the evolution of man from the lower forms of life. Consider for a moment the quadrupeds; take the horse, the dog, the cat, for example, no one hesitates for a moment to recognize the fact that their pelvic organs are held in place by ligaments. Their anatomical structures—the ligaments, the blood supply, etc.—are on the same plan as the human. The upright posture has not modified these materially, and the functions of the floor of the pelvis remain the same, *viz.*, to fill in anatomical space, and to assist in parturition and defecation, by lifting the perineum over the head of the fetus in one instance and over the fecal matter in the other.

Reverting to the original function of the floor of the pelvis in the support of the pelvic organs, I still insist that *when the uterus and bladder are in normal position, the pelvic floor exercises no influence whatever in their support.* We have had the suggestion that nature should be thrown to the winds; “we do not care how she does things.” Still I must insist that in the evolution of organs and tissues there is always discoverable an adaptation of means to ends that cannot be ignored. Some uniform underlying principle or law is involved, and the key to any specified process lies in discovering that general law or plan. Now Nature’s plan of holding organs in place is by suspension. Take the heart, the lungs, they are suspended; they do not rest upon anything beneath them. Come down into the abdominal cavity where are the liver, the spleen, the intestines, etc., all these organs, we recognize, are held in place by their ligaments, the abdominal wall simply affording a restraining circumvallation. Their specific gravity does not determine their position in the abdominal cavity, the liver is at the top, and the lighter organs below.

Nature is consistent and when we come down into the pelvis, the natural conclusion is that the uterus like all the above-mentioned organs is held up by its ligaments. When we examine the uterus, we find that weight for weight it has more ligaments than any other organ in the body. We are told they are for guy ropes; I claim that they are to support that organ in place.

It is within the experience of most gynecologists to have seen virgins with procidentia of the uterus, also nulliparous women with procidentia of the uterus. There is no rupture

of the pelvic floor; it is as complete according to nature's plan of making the perineum as is possible and yet there is prolapsus. The fault obviously is with the ligaments. Again if the perineum is torn clear through into the rectum, its supporting power entirely gone, the rule is that the uterus and bladder stay in place. Why? Not because they are held up by what is left of the perineal floor but by their ligaments. Why should there remain such uniformly efficient support in cases in which the laceration is complete and yet be so uniformly disastrous when the support is only partially destroyed? Certainly if you have a house resting on a foundation and that foundation is knocked out, the house comes down, but knock out the foundation you have constructed for the uterus and still that organ stays in place, and, *per contra*, in the presence of an intact pelvic floor but with relaxed ligaments the uterus falls to a degree of procidentia. I have yet to hear any one answer that argument.

If the perineum does not support these organs, why do we repair it when it is torn? If it is torn partially then the organs come down. Why? Not because the support has been taken away, but because there has been introduced a new force not in existence before, an entirely new force that is dragging and pulling upon the uterus in the shape of a rectocele. This is explained as follows: Reaching from the posterior lip of the cervix to the anus in an S-shaped curve is a line of tissue—the vagino-rectal wall. This obtains when the tissues are *in tact*. Now when the perineum is torn to the second degree this line of tissue is forced by the rectocele to make a greater curve—after allowing for a certain amount of stretching, every increase in the amount of the rectocele (the curve) necessitates the approach toward each other of the two ends of this line of tissue—and as the distal end (the anus) is forced down by straining at stool the upper end (the cervix) is the one that must give way, and is dragged down. This process continues to overcome the supporting power of the ligaments until the uterus is dragged down into the axis of the vagina, from there to the vulva, and finally out into the world in complete procidentia. When we have a tear to the second degree, it is very important, therefore, to repair the perineum; it must be repaired to save the position of uterus, not because the support has been taken away, but because by reason of this lesion a new force has been introduced pulling the uterus down. If it is

torn clear through we have no pull on the uterus; the organs stay in place.

Now about the causes of cystocele. I believe, on the same principle, that the bladder is held up by its ligaments. One large support of the bladder is the uterus. The ligaments hold up the uterus and the uterus in turn supports the bladder. This is accomplished by the direct attachment of the bladder to the anterior wall of the uterus and by the firm insertion into it of the upper end of the vaginal wall. In addition to this is the fascia lata which comes down from either side, passes underneath the bladder and suspends it as in a sling or hammock. These are the two principal supports.

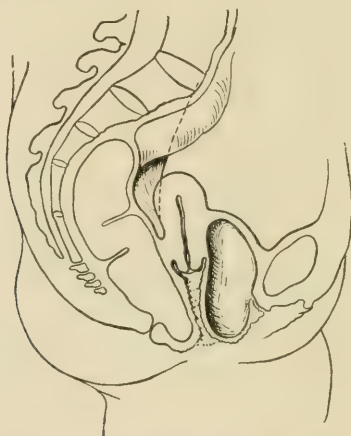


FIG. 1.—A simple case of retroversion and descensus, with cystocele and rectocele; a common type. A child-bearing woman in whom the uterus should be retained.

In cystocele two conditions obtain, viz., a descent of the upper support—the uterus—and a hernia of the base of the bladder through the vaginal sheath (Fig. 1). In extreme conditions all of the uterus and bladder may protrude through the vulvar opening. In addition to this as described by Dr. Dickinson the various planes of tissue composing the versico-vaginal wall may slip one upon the other and the bladder wall slide down below its normal relative position.

It is quite true that it is impossible in extreme cases of procidentia to restore all the parts to an ideal normal position that shall be permanent. My contention is, however, that we should aim to accomplish that as nearly as possible. And that, I

believe, is what my operation does. Let us consider for a moment the physiological action of the bladder. Howard Kelly has clearly described this as follows: "As the bladder empties, the upper, more movable portion, covered with peritoneum, settles down into the lower and relatively more fixed portion, which lies in close relation to the vagina, until it comes to lie within it as one saucer rests in another. During respiration the free upper half may be seen (through the cystoscope) moving on the lower half, as if hinged, and the line of demarcation between them may be distinctly made out. At the edges where the two saucers meet, three folds are formed: the right, left, and posterior. The posterior fold stretches from side to side in front of the uterus; it is gently convex forward, following the contour of the uterus and ends in front of each broad ligament, where each lateral fold begins and extends horizontally around toward the urethra. These folds represent the physiological hinges on which the bladder moves in expanding and collapsing. The apices, where the posterior fold joins the lateral folds in front of the broad ligaments, are called the right and left vesical cornua."

The operation I have devised takes cognizance of the two distinct hemispheres of the bladder, viz., that portion below the line of hinges—the base of the bladder—which is a comparatively fixed, inelastic immobile structure, and the upper hemisphere which is covered by peritoneum and is elastic and expansive; speaking concisely, the operation restores the base of the bladder to its normal immobile position and condition, allowing the upper hemisphere to take care of itself. This is accomplished in simple cases by dissecting the base of the bladder free from all of its attachments, hanging the uterus in its normal position by shortening its ligaments and then restoring the bladder to its original position and fastening it there in such a way as to carry it up into the pelvis and restore the former line of hinges. Three chromic catgut stitches—one in the median line and one at each cornua of the bladder—spread out and fix the base of the bladder, after which the facial sheath and mucous membrane of the vagina are cut out sufficiently to make the vaginal wall, including the fascia lata, when its edges are stitched together, snugly fit the base of the bladder in its new position.

In cases of extreme procidentia, especially in women at or beyond the child-bearing period the uterus is removed and

the broad ligaments stretched together across the p  lvis, taking all the slack necessary to make them taut. Upon this newly constructed plane of tissue the bladder wall is spread out and stitched as previously described. To this support is also attached the upper end of the vagina after its wall has been abbreviated to bring into support the fascia lata. In all cases in which a rectocele exists the perineum is repaired.

The technic of this operation is as follows: A cross incision slightly curved or straight is made in front of the cervix as in vaginal hysterectomy. The middle point of this incision is then caught with an artery clamp and firmly dragged down while with a blunt spud or dissector the bladder is stripped

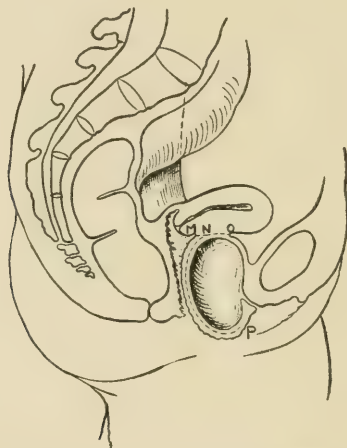


FIG. 2.—Transverse incision made in front of cervix and longitudinal incision from N to P. The peritoneal cavity has been entered at O, the uterus carried up into place and the round ligaments shortened.

off from the interior face of the vaginal fascia, reaching out well on either side till the entire organ is set quite free throughout its entire base and sides. The anterior vaginal wall is then slit up with scissors in the median line throughout its entire length, reaching well up to the base of the urethra. The base of the bladder is then lifted on a retractor, the vesico-uterine pouch entered and the peritoneum torn across the face of the uterus out onto the broad ligaments (Fig. 2). Through the opening thus made the fundus uteri is restored to its normal position and maintained there by the shortening of its round ligaments. The object of the next procedure is to carry up into the pelvis and to fix the firm immovable base of the bladder

according to nature's plan, by following Kelly's description, *i.e.*, restoring the folds or hinges of the bladder by fastening the bladder up, not only in the median line, but also restoring the two cornua of the bladder. To accomplish this a point (Fig. 3) is selected in the middle line of the base of the bladder wall which when carried up to the torn edge of the peritoneum on the anterior face of the uterus, middle point, will take up all the slack in the base of the bladder, making a comparatively straight line from the urethra to the uterus. Through this point a suture is passed and carried also through the selected point on the anterior face of the uterus (Fig. 4), catching up in its course the corresponding torn edge of the peritoneum



FIG. 3.—The vagina has been dissected from the bladder at either side of the longitudinal incision and the vesico-uterine peritoneum torn through. Point B is selected, which when carried to C, will lift the curve A B to a straight line A C, when it is secured by suture.

on the bladder. This suture is left long and is not tied till all the sutures are passed. Two points are then selected in the base of the bladder, one at either side on a transverse line with the first selected point, and equally distant; these two points indicate the cornua of the bladder. Through them similar sutures are passed and carried through the round ligaments or points on the torn off edges of peritoneum on the surface of either broad ligament sufficiently distant from the middle point to take up all the slack in the base of the bladder, from side to side; these sutures are also left long. The three sutures are then tied successively, beginning with the middle one. The effect of this is to stretch the base of the bladder taut and

smooth in every direction. This restores the support of the bladder which is derived from the uterus; in addition to this it is necessary to overcome the condition of hernia, and secure to the bladder the support which it receives from the fascia lata. This is accomplished in the following manner: The fascia along the middle line of the vaginal incision, and the mucous membrane as well, are then trimmed off at either side, sufficiently to remove the overstretched and ruptured part of the fascia and secure for support the strong uninjured portion of the fascia lata. The freshened edges of the fascia lata and vaginal mucous membrane are then stitched together throughout the whole length of the vagina, thus bringing it up snugly

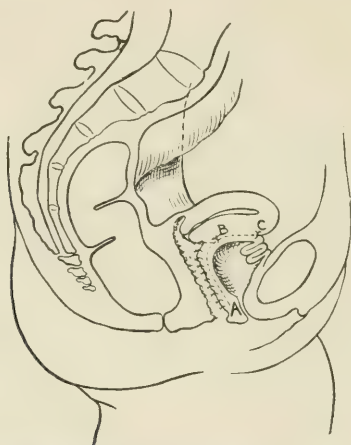


FIG. 4.—Point C in Figure 3 is carried to C Figure 5 and B to B. The vaginal membrane and fascia have been trimmed to fit and suture applied.

against the base of the bladder. The uterine end of the vaginal incision is then stitched to the uterus directly under the attachment of the bladder.

To secure the uterus against the disastrous pulling of a rectocele, the floor of the pelvis is restored, being careful to secure the fascia of the levator ani, and the operation is complete.

Previous to beginning the operation, any lacerations of the cervix are repaired, the uterus dilated and curetted, and packed with gauze. At the close of the operation a piece of vaginal gauze is attached to the uterine gauze to assist in removal, and the vagina lightly packed. This gauze is all removed upon the third day. No vaginal douches are given in the after-

treatment, unless there should be a vaginal discharge, and then only for cleansing purposes, at a temperature of 100° F.

I have thought it well to review the steps in this procedure for the milder cases of displacement and cystocele, as the operation I now use for the extreme cases of procidentia is simply an application of the same principle to the new condition. In these cases which occur in women at or near the menopause, there is such a relaxation and complete lack of support in the tissues that normal sustaining qualities of the tissues are hopelessly lost. As age comes on there is frequently a change in the direction, or the point of impact of the intraabdominal pressure due to the elimination of the vertebral and pelvic curves, a settling down upon each other, as it were, of the abdominal and pelvic cavities. All methods that have previously been resorted to, to retain the uterus in these cases have proved unavailing. It matters not what the procedure, even the stitching of the fundus between the muscles and the fascia of the recti does not prevent the cervix and bladder from protruding through the vulva sooner or later. It is my custom, therefore, in all these cases to remove the uterus, and, in order to enable me to carry out the features of my operation, as previously described, I stitch together the broad ligaments across the pelvis, taking in all the slack necessary to make them taut. Upon this newly constructed plane of tissue the bladder wall is spread out and stitched, and thereby receives its support. To this is also attached the upper end of the vagina, after its wall has been abbreviated, to bring into support the fascia lata. In cases in which the rectocele is large, and the rectal wall very redundant, I have applied the principle of plication to the anterior rectal wall, taking in as many as two or even three tucks, by means of buried sutures passed longitudinally to the lumen of the gut in lines running across from side to side. In front of this the pelvic floor is reconstructed. The effect of this is most admirable, and the permanent results pleasing to the last degree.

The Technic.—In the removal of the uterus, the blood supply is controlled by a chain ligature of plain catgut reaching from the base of the broad ligaments to the border above. In the process of removing the uterus the bladder is dissected away from its attachments to the vagina, and the vaginal wall incised longitudinally. This permits of the insertion of a broad retractor which gives free access to the entire pelvic cavity.

In full view and with ready access, beginning with the round ligaments, the broad ligaments are stitched firmly together down to their base (Fig. 5). In doing this, care is taken to reach out sufficiently far on the ligaments on either side to make them pull taut across the pelvis. This turns the raw edges of the stumps posteriorly and gives a smooth peritoneal surface on



FIG. 5.—The uterus has been removed. B.B. Broad ligaments. R.R. Round ligaments. A suture of silk or linen is passed through the round ligaments at a sufficient distance from the ends to make them draw taut when the suture is tied. The suture is then continued down the entire width of the broad ligaments, turning all the raw surfaces posterior, and forming a bridge of tissue upon which the bladder is spread out and supported.

which to spread out the bladder. Three sutures of chromic catgut No. 2 are then passed through the round ligaments, one at their middle juncture, and the other two either side at a distance of 2 inches; these are left long and successively passed through selected points in the base of the bladder sufficiently near to the urethra to spread out the bladder upon the

broad ligaments in a smooth plain reaching from the urethra to the points of attachments, the two lateral sutures carrying the cornua of the bladder, and the middle one catching up

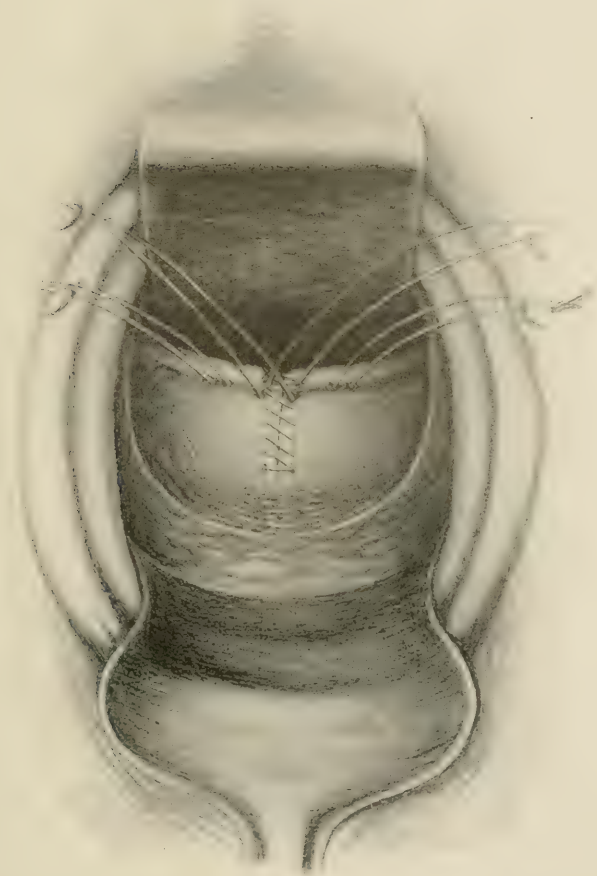


FIG. 6.—The round and broad ligaments have been sutured as previously described. Four sutures of chromic gut No. 2 are then passed and left long until all are in position. Suture A is then passed through the tissue in the base of the bladder at its middle point (B. Fig. 3.) and then in succession C is similarly passed one inch to the right of B (Fig. 3.) and B one inch to the left of the same point, these sutures are then tied in succession from side to side. Suture D (after the longitudinal incision in the vagina has been closed) is passed through the upper end of the vagina and tied, thus securing it to the broad ligaments.

the peritoneum on the dome of the bladder, as previously described. The anterior vaginal wall and fascia are then trimmed away and stitched with interrupted sutures, the

upper end of the line of sutures being stitched to the broad ligament plain snugly beneath the bladder.

To overcome the rectocele, a strip of mucous membrane the width of the rectum is removed from the posterior vaginal wall from the upper end of the vagina to the vulva. The hand being protected by a rubber glove the left index finger is passed into the rectum. With this as a guide beginning with the torn edge of peritoneum above, a line of buried chromic catgut sutures, the stitches passing up and down and taking in as much tissue as seems wise, is applied across the rectum. If this line of sutures does not obliterate the bulging of the rectum, a second line of sutures is passed, and sometimes even a third. In front of this the gaping vagina is closed with interrupted chromic sutures, the pelvic floor being carefully restored as the vulva is approached.

It is important in these cases to drain the broad ligament stumps by a strip of gauze packed into the cul de sac of Douglas. Care must be taken, therefore, not to close the head of the vagina too tightly. This gauze is left in place till the third day and then gradually removed.

616 MADISON AVENUE.

POSTOPERATIVE NEUROSES OF PELVIC ORIGIN.

BY

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El Paso, Texas.

(With five illustrations.)

FAILURE on the part of neurologists to recognize gynecological disease, and failure on the part of gynecologists to appreciate nervous disease or its manifestations in women, only too frequently serves as a stumbling-block in the cure of many cases amenable to proper dual treatment. Pelvic troubles in women manifest the association of two great factors, viz., pathological changes in the structure and position of the pelvic viscera, and secondary to such changes inflammation or compression of the sympathetic ganglia, large nerve plexuses and cords, passing through or stationed within the pelvis. It is not pre-operative pelvic symptoms alone that urge the surgeon who does gynecological work to investigate the nerve structures of the lower part of the abdomen, but also the pathological changes within the nerves themselves, which still exist after

the inducing causes of such change have been removed and which are of vital importance. Postoperative sequelæ in any form are not only discouraging to the patient, but decidedly embarrassing to the operator. Pelvic pains and referred pains, originating within the pelvis, many times still exist weeks after an exceedingly extensive, dangerous operative procedure, leading the patient and friends to the conclusion that the operation has been a failure.

The histological anatomy of the pelvic group of nerves, which are composed of an exceedingly intricate sympathetic system and an extensive cerebrospinal nerve distribution, is the histological anatomy of both these systems in the other portions of the body.

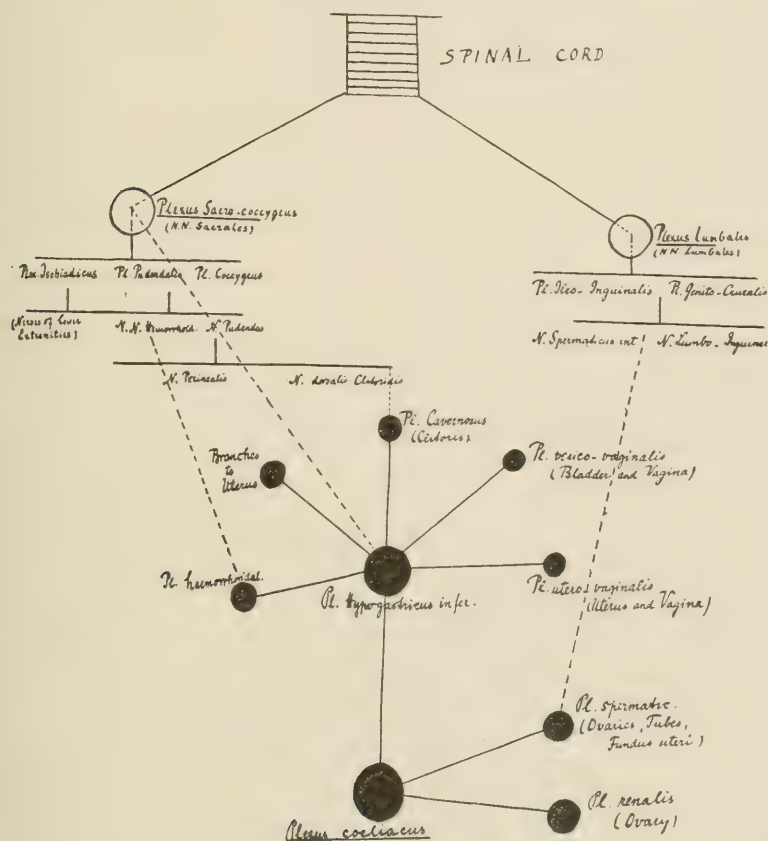
The neuron, composed of a cell body of nucleus and nucleolus, centralized within a fibrillated or Nissl-bodied protoplasm, gives out from its surface two types of processes, one the dendrites, carrying nerve waves toward the cell, and varying markedly in number, whose twigs interlace with the dendrites of similar cells; the other, the axis-cylinders (neurites), usually but one in number, carrying waves from or to the cells, according as to whether the cell is motor or sensory, its processes varying as to its protecting medium. The motor, or white, are covered with a medullary substance, or the white matter of Schwann, over this a neurilemma or sheath of Schwann, with its nerve corpuscles; the sensory nonmedullated or gray, are simply sheathed with a neurilemma. The motor and sensory axis-cylinders frequently blend, as in the construction of the chief cerebrospinal nerves, into a united bundle or funiculus, which is simple or compound according as to whether or not they form a small or large nerve cord. The axis-cylinders are held together by a trabecula of connective tissue, known as the endoneurium, a group or funiculus, by the perineurium, about the latter trabeculated connective tissue, known as the epineurium, which gives passageway to blood-vessels, lymphatics, nervæ nervorum, or nerves to the larger nerve cords. The epineurium is the outer sheath of the nerve cord. Along the course of certain nervous cords, such as those constituting the sensory roots of the spinal nerves, especially of the sympathetic system, groups of nerve cells occur, associated with the nerve fibers in the form of ganglia. These may be large and conspicuous, or their size may be microscopic, as are many of the interstitial ganglia connected with the

distribution of the sympathetic fibers. The outer covering of the ganglion consists of a fibrous envelope, in many cases a condensation of the adjacent epineurium, forming delicate bundles of connective tissue, which serve for the union and support of the cells and fibers. Some of the nerve fibres pass through the ganglions on their way to some more distant point, without joining any of the nerve cells, while many others end in or originate from these elements.

The presence or absence of the medullary coat depends upon the character of the component fibers of the nerve trunk. When an axis-cylinder joins a muscle cell the medullary substance disappears, while the neurilemma of the fiber continues and becomes the nucleated capsule when it meets a nerve-cell, enclosing the individual nerve-cell. The latter in the genital organs possess a spherical form (the spherical cell of Krause), and are usually provided with one or two, seldom more, processes (Piersol). The nerve fibres or axis-cylinder of a nerve-cell at first are pale, and possess neither medullary substance or neurilemma, but later the motor type acquires both; the sensory acquires only the neurilemma. At regular intervals along the medullated nerve-fibers well-marked annular constructions occur. These are the nodes of Ranvier. When a medullated nerve-fiber branches, its bifurcation corresponds in position to a node of Ranvier. In the peripheral terminations of axis-cylinders each appears as a naked structure, unless ending in ganglion cells. The axis-cylinder is a fibrillated structure, ending in an interlaced meshed formation, forming a ground plexus about or over muscles (Gray 1; Landois 2; Piersol 3).

By aid of Nissl's method, Keiffer (4) has found in the uterus of the bitch, monkey and woman, special cells, which in all respects histologically resemble ganglion cells, varying in the different species of animals examined. By Golgi's stain he has shown that these cells are of the sympathetic type, having one or more protoplasmic prolongations and an axis-cylinder. These prolongations form plexuses; there appear to be nerve-cells whose processes seem to supply the muscle fibers. A majority of the nerve-cells seem to be on the surface of, or near, the uterine blood-vessels of all sizes. They are even found in the walls of the vessels, between the smooth muscle fibers. They are seen on the surface of the capillaries, and their processes are in contact with the vascular endothe-

lium. Though existing throughout the mucosa, they are especially found along the vessels and under the epithelium of the glands. Their processes terminate as free points or slightly button-shaped swellings. As the walls of the blood-vessels become reduced soon after entering the uterus to simple endothelium, in direct contact with muscular tissue, Keiffer



The dotted lines indicate the combinations.

FIG. 1. (After Legrand.)

says that the whole uterus may be considered as merely a sort of muscular expansion of the vascular walls, hence, stimulation of the vasomotor nerves of the uterus would result in contraction or relaxation of the entire uterus. In the neighborhood of the vessels, especially at their points of bifurcation, are found nests of ganglion cells, which actually appear to be intra-

uterine ganglia. A measure of the activity of the uterus may be attributed to these cells, in cases of destruction of the lumbar centers, the pelvic plexuses of the sympathetic, or the nervous connection of these centers by myelitis or pelvic suppurations.

Keiffer further states that the uterine ganglia undergo certain changes, as do those of the cerebrospinal system in general, as a result of pathological changes within the uterus, such as growths, suppurative conditions or inflammation. He further avers that in the human embryo these cells may be demonstrated by Nissl's stain, after seven and one-half or eight months.

That such a sympathetic nerve structure exists in the uterus is simply analogous to the special cell-bodies long known to exist in the nose, the eye, the ear and the tongue. Ganglionic nerve bodies have been demonstrated to exist within the ovarian substance (Gray). The gross nerve structures within the pelvis—speaking in ratio to their liability to intrapelvic injury or pathological conditions—are composed of the genitocrural, obturator and anterior crural branches of the lumbar plexus, the sacral plexus, the ovarian-uterine plexuses, and parts of the gangliated sympathetic cord, the latter extending from the coccygeal plexus to the base of the brain, with communicating fibers between it and the hypogastric, aortic and solar plexuses; and the fourth and fifth sacral nerves. The other branches of the lumbar plexus, viz., the ilio-hypogastric, ilio-inguinal and external cutaneous nerves, are involved through plexus contiguity or reflex effects, in intraabdominal pathological states.

The relationship of the genitocrural nerve to the psoas muscle, descending as it does on its surface, lays it peculiarly liable to infection of its sheath or funicular substance, in psoas or retrocolonic appendicial abscesses, and diffuse peritonitis. In such cases abolition would occur of the cremasteric reflex and anesthesia of the upper and anterior aspect of the thigh.

The obturator nerve also penetrates the substance of the psoas muscle, and continues with it to the brim of the pelvis; then runs along the internal lateral wall of the pelvis to the obturator foramen. Pelvic exudates, fetal head pressures, and injuries by forceps blades are the chief etiological factors in its involvement in an intrapelvic sense. Symptoms of its involvement are irritation or paralysis of the adductors of the

or neuralgic pains along the anterior and internal aspect of the thigh, and even in severe irritations may even extend to the inner side of the leg and foot, which constitute the distribution area of its sensory internal saphenous branch. The sacral plexus, which is composed of the lumbosacral cord, the anterior branches of the three upper sacral nerves and part of the anterior branch of the fourth sacral, as a mass is triangular in shape, with its base against the sacrum, its apex pointing toward the sacrosciatic foramen; situated upon the surface of the pyriformis muscle, its four main branches, viz., superior gluteal, pudic, small sciatic and great sciatic, being separated by this muscle in their exit from the pelvis through the great sacrosciatic foramen; it is protected in front by the pelvic fascia, which separates it from the viscera of the pelvis; is located by the greater and lesser sacrosciatic ligaments, pyriformis muscle and tuberosity of the ischium, through the rectum and sometimes the vagina, and furnishes the chief cerebrospinal representative involved in pelvic pathological conditions.

The chief etiological factors in intrapelvic involvement of the sacral plexus are retroflexed uteri, broad ligament masses, ovarian and tubal enlargements and displacements, fecal masses in the sigmoid and rectum, localized and diffuse pelvic inflammations and their results, suppuration, exudations and connective-tissue constructions, fetal head pressures, forcep injuries and malignancy of pelvic structures. A symptom of its involvement in an irritative way is the neuritic irritation of its branches. Frequently, such symptoms as sciatica and rheumatism of the hip are simply manifestations of inflammation of the intrapelvic portion of the long sciatic nerve.

The experienced gynecologist explains that the wide manifestation of irritations resulting from metritis and perimetritis is due to ganglionic irritation of the uteroovarian, vesical, intrauterine and intraovarian interstitial plexuses, which, through their connecting fibers, produce irritation of the hypogastric, aortic, solar and renal plexuses. The intercostal neuralgias of the sixth and tenth intercostal nerves, one to three on the left side (Dana, Graves, Church and Peterson) are simply reflexes from the solar plexus through the lesser and greater splanchnic sympathetic nerves. The gastric phenomena of pregnancy, retrodeviations of the uterus and metritis are but the pneumogastric extensions of reflex solar plexus irritation. Renal aches of multilocular ovarian cysts, ovarian

and tubal prolapsus, particularly upon the left side, are explained by the presence of the sympathetic nerve chain accompanying the left ovarian vessels to the renal venous supply.

The pathological changes in nerve structures subjected to prolonged compression—whether induced by a fetal head, retrodeviated enlarged uterus, ovarian, uterine, or tubal tumors, or constriction by exudates, the result of a pelvic cellulitis—are the changes incident to neuritis or inflammation of the

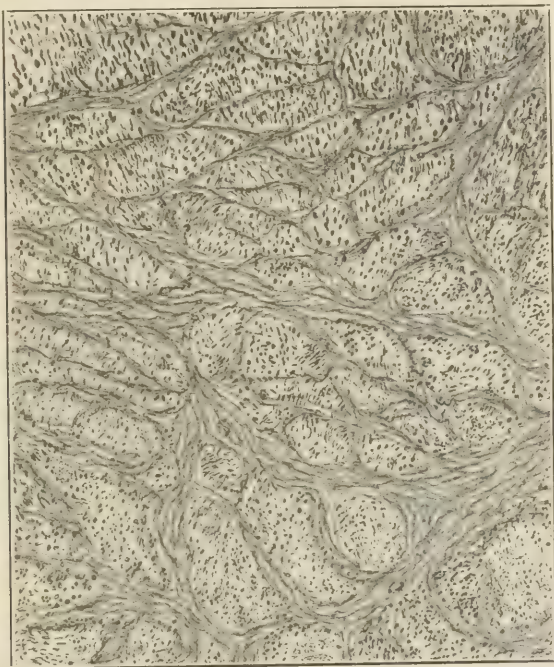


FIG. 3.—Camera lucida picture of interstitial changes resulting from compression of nerve.

sheath or interstitial substance of the funiculi or nerve bundles. Should one recall the histological anatomy of a nerve cord, the blood and lymphatic supply, located within the epineurium, the idea instantly occurs of septic infection of the nerves through the hematogenic and lymphogenic routes. Myelitis is analogy.

Singer(6) says that the majority of acute myelitis cases, or so-called acute cases, are not inflammatory, but are due to thrombosis of the spinal vessels. Williamson, Gowers,

Oppenheim, Maria, Dana, Church and Peterson advocate the same theory.

Sciatica, with its persistent nature and distressing symptoms, for centuries has lead medical men to make careful study as to its cause. To us men doing gynecological work and meeting intrapelvic nerve manifestations, local or referred, sciatica gives an illustration of irritation of one branch of the sacral plexus, and one that is of great interest. In the main, we have a distinct neuritis in sciatica. Stengel(7) and Adami(8) speak of four types of neuritis—acute and chronic interstitial, and acute and chronic parenchymatous. In a suppurative condition within the pelvis, culdesac location, well-walled off, exerting considerable displacement of the pelvic viscera, and which has existed for considerable time, the extension of the infection in the early stages of its existence is notorious.

The sacral plexus, separated from the pelvic viscera only by the pelvic fascia, readily receives its share of general pelvic infection. The lymphatics and blood supply of this plexus are the lymphatic and blood supply of the pelvis, and through these routes we have the etiological factors of acute neuritis, viz., leukocyte extravasation, lymphatic exudation and red blood-corpuscles wandering within the interstitial substance of the nerve sheath. These changes are accompanied by edema of the sheath and compression of the individual axis-cylinders. Should inflammation extend to suppuration, destruction of the neurilemma and exposure of the axis-cylinders would result.

In the coatings of a nerve bundle, simple or compound, we have the analogy of the insulation of an electric wire, which, if denuded, and a good conducting medium brought in contact with it, dissemination of the current would take place. Denude an axis-cylinder of a sympathetic or cerebrospinal system cell, and bring a dendrite of another cell in contact with it, and dissemination of its nerve wave takes place.

Althaus,(9) in discussing the probability of the work of the neuron being of an electrical nature, reviews the classic works of Waldeyer, Kolliker, Golgi, Ramon y Cajal, Nissl, His, Fleschig, and Ambronn, upon the nerve structures, particularly the brain, and utilizes the analogy of the neurilemma to rheophore coating of electrical conduction, in explaining the peculiar pains appearing in cases suffering with neuritis,

due to the destruction of the myeline sheath as a result of infection, thus exposing the axis-cylinders.

Maddin,(10) in speaking of the neuron, states that the highest and most complex part of the assimilating function of the entire human economy finds expression within it. Error in any of

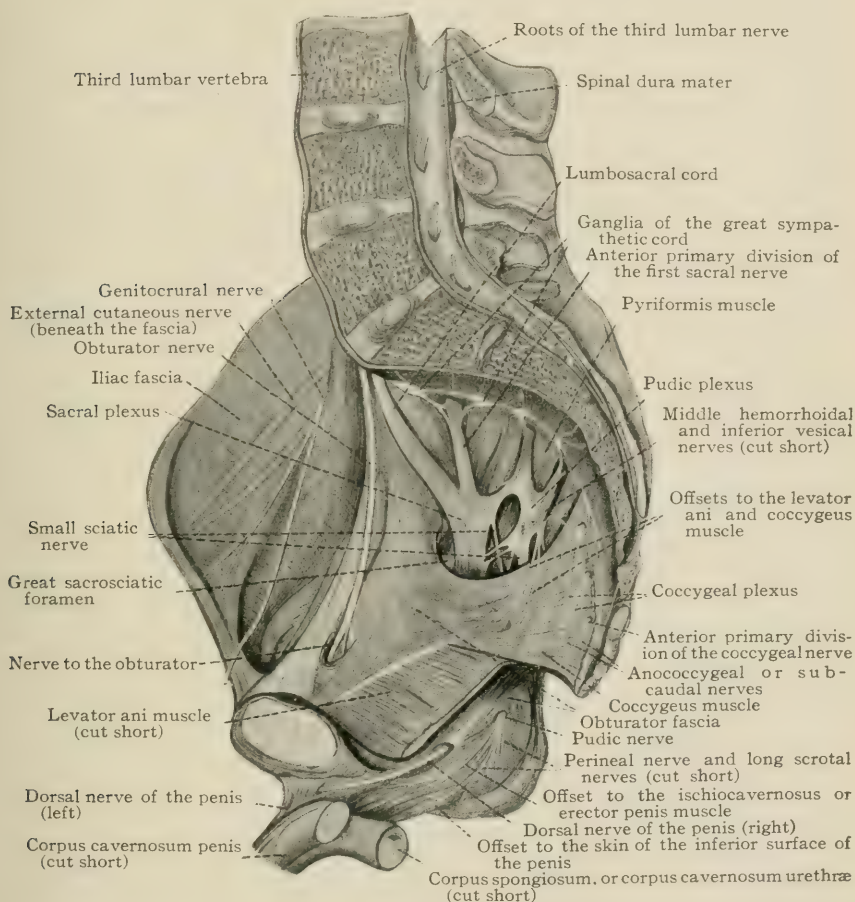


FIG. 4.

the factors of a neuron's metabolism will abort its physiological work, whether this work is in the path of assimilation or disintegration.

Barker,(11) in his classic monograph upon the neuron, says: "The nerve life of the individual includes all of his reflex, instinctive and volitional activities, and is the sum-

total of the life of his milliards of neurons. One individual neuron, through its various processes, is in a position to be affected by, and in turn to affect, several other neurons."

Woolsey⁽¹²⁾ classifies neuritis as isolated, localized or simple. In such cases there is usually inflammation of the sheath and of the connective tissues extending between the nerve bundles, and is known as perineuritis or interstitial neuritis. There is hyperemia, with redness and swelling of the perineurium, or increase of the interstitial connective tissue, or both may exist. The inflammation may even become suppurative or gangrenous.

Secondary neuritis of pelvic origin, due to some intrapelvic trouble, has stages corresponding to the stages of its cause. This cause may have, and, in the majority of gynecological cases has, existed for long periods of time, and the nerve changes being chronic, demand weeks and months for a return to the normal. The reason for this delay in the regeneration of a nerve is that its compression brings about a degeneration, a mechanical disturbance of its fibers. Should any of the conditions producing the compression exist for any length of time, local destruction of the axis-cylinders may occur. The symptoms vary with the cause, location, degree of the lesion, and the character of the nerve, yet in all cases the function of the affected nerve is perverted, exalted, diminished, or lost.

True essential neuralgia is rare as a result of intrapelvic troubles, but myalgia and reflex pains are very common. Symptoms of uterine and ovarian conditions cause pains in the loins, back and buttocks. The two upper lumbar plexus branches, being mainly sensory nerves, frequently manifest reflex irritation in the form of lumboabdominal neuralgia, the pains extending down to the hypogastrium or genitals, often on one side.

Diseases of the external genitals and bladder more often reflect pains through the sacral nerves, particularly the pudic and the fourth sacral. Metritis produces referred pains to the intercostal nerves (sixth and tenth most frequently), through the greater and lesser splanchnic. Multilocular ovarian cysts, and other cortical and interstitial ovarian lesions, produce pains in the renal region. Large ovarian cysts produce irritations of the obturator and superior gluteal nerves, giving pains and skin irritations of the hip and buttocks. Fetal head compressions, large fibroids and myomatous uteri, produce reflex

pains in the lumbar nerve distribution. Endometritis produces irritation of the intrauterine ganglias, and thus a spasmodic contraction of the internal os, and, as a result a neurotic dysmenorrhea. Cervical involvements, such as large Nabothian cysts, and chronic vaginitis, are followed by vaginismus, through

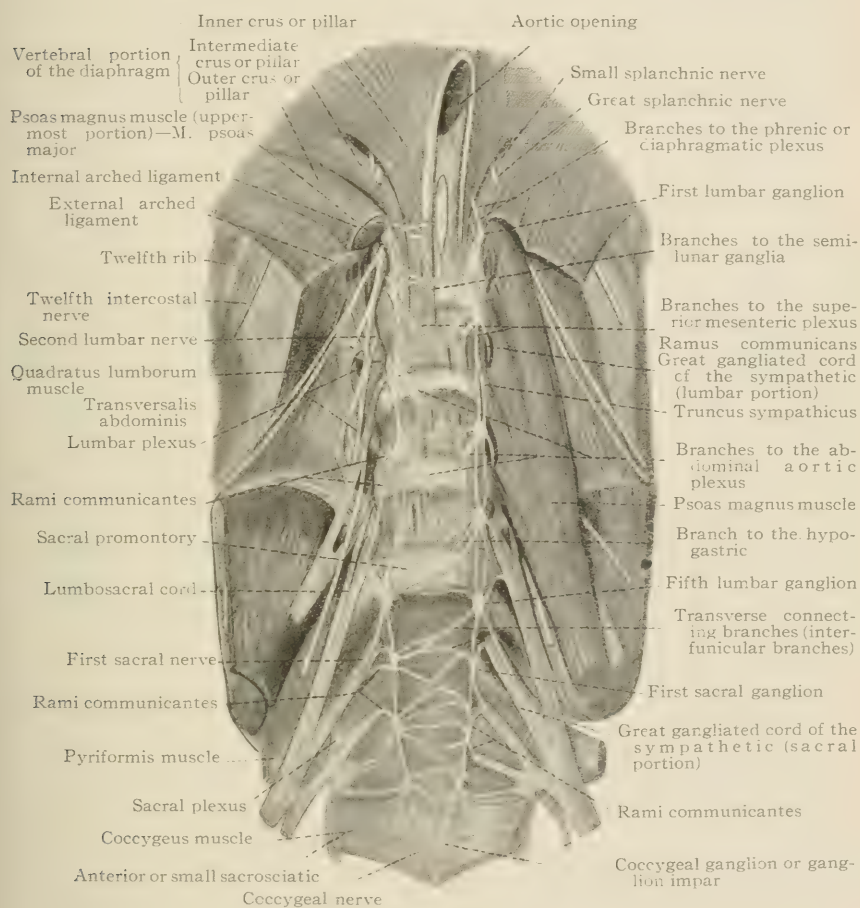


FIG. 5.

irritation of end arborizations of the pudic, the sacral, and the vaginal gangliated plexuses of the cells of Krause.

Each diseased organ, or diseased part of a pelvic organ, has some distinct nerve point or area of reference. I am thoroughly aware of the firm stand taken by leading neurologists, as to the nonexistence of intrapelvic sources of neurasthenia. Peterson,(13) Dercum,(14) and Mayer,(15) in 1898, before

the American Medical Association voiced this opinion. Nevertheless, I am constrained to believe that a state of nerve fatigue—offered in explanation of such a prevalent disease as neurasthenia, with its wide manifestations—must have some other than an idiopathic etiology.

For centuries dropsy was classified as a disease entity; now, it is regarded as simply a symptom of a renal, hepatic, or cardiac trouble.

The well-known heirship to distinct pathological involvement, *de novo* or secondary, on the part of the sympathetic and cerebrospinal supply of the genital organs, and the sympathetic cerebrospinal supply of the gastrointestinal tract, of the dendritic prolongation of intraspinal cells, together with the nerve supply of other special organs in the human economy, to my mind, are a better explanation of this widespread nervous trouble than simple nerve fatigue.

That an intrapelvic trouble can exist without local manifestations, but with varied reflex symptoms instead, the following summary from a wide literature goes to prove, and should lead one to hesitate in accepting even the conclusions of savants.

Pearce and Beyea(16) utilize the nerve manifestations accompanying menstruation, sexual excitement and the menopause, to prove the relationship of the general nervous system to the pelvic system in women. Humiston(17) cites the benefit of correcting retroflexed uteri conditions in cases of melancholia, neurasthenia, insanity, hystero-epilepsy, and hysteria.

Emmett cites cicatricial cervical plug reflexes.

Fleiss(18) cites inferior turbinate and septal points of irritation in nervous dysmenorrhea.

Garrigues,(19) the hyperesthesias of the genitals, vaginismus contractions of the perineal and levator ani muscles, in pressure and exudate involvement of the intrapelvic nerves, particularly the pudic and the fourth sacral.

Murray(20) mentions the pruritis vulvæ of the aged, the perineal and cervix reflexes in their respective lacerations, long existing.

Boldt,(21) the curious reflex cough described by Profanter, in which no lesion could be found in the air passages, and, finally, was found to be produced by a small pelvic mass, an exudate which when pressed upon produced the cough.

In further refutation of the nonpelvic origin of many nervous phenomena in women, Pozzi,(22) in commenting upon neuroses

and neuralgias of genital origin, explains their pathology through the richness of the innervation of the genital organs, which are supplied from the great sympathetic through the hypogastric plexus, and from the spinal cord through the internal pudic and fourth sacral nerves. He claims that reflex neuralgias are very common in women, and cites Bassareau's assertion that intercostal neuralgias in women are always connected with metritis. Pozzi further mentions facial and lumboabdominal neuralgia, and pain radiation along the cutaneous femoral branches, particularly down the left leg in intrapelvic troubles.

Gellhorn(23) cites the incidence of a woman, aged twenty-nine, two months after her second confinement developing a severe anorexia and constant nausea, which resisted all forms of gastric and systemic treatment. Gynecological examination showed a partly fixed retroflexed uterus and endometritis. Correction of the misplacement and curettage rectified the stomach symptoms.

Eisenhart(24) reports the case of a woman, aged forty-two, suffering for months with constant vomiting, gastric pains, cardiac palpitation and copious menstruation. Examination showed a floating right kidney and retroflexed enlarged mobile uterus. Correction of the kidney misplacement failed to improve the patient. Subsequent correction of the uterine deviation cured the case.

Hewitt(25) cites the instance of a girl, aged twenty-seven years, who suffered from nausea and vomiting for nine years, which at first appeared only during menstruation, but later occurred during the intermenstrual periods. Emaciation and progressive weakness occurred, despite dietetic and internal treatment. A gynecological examination was made, and retroflexion of the uterus was found. Replacement of the uterus, combined with general treatment, restored the patient to health.

Gellhorn, in his article, cites Mooren as describing several instances of disturbed vision and diseases of the eye caused by some deviation of the uterus. Boldt, in a paper on genital neuroses in the female, describes a case of a young girl, aged thirteen, whose menstrual periods were accompanied by a purple discoloration of the skin of the right upper extremity, interwoven with white spots the size of a lentil, paresthesia and swelling of the right leg and foot. Examination disclosed an

enlarged and prolapsed right ovary. This being extirpated corrected all her trouble.

Profanter(27) observed a patient who for years suffered from so-called sciatica on the left side. After exhausting many methods of treatment without benefit, a gynecological examination disclosed a prolapsed inflamed left ovary. Manipulation of the same giving no reflex, further search was made in the left pelvic cavity, which, at the point where the pyiformis muscle overbridges the sciatic nerve, in the passage of the latter through the greater ischioid foramen, revealed a chronic inflammatory mass, pressure upon which promptly produced an intense sciatic pain.

Profanter also cites Aran's case of a young woman suffering with a so-called tubercular cough, in whom examination elicited the existence of a metritis, cure of which was accompanied by a cessation of all pulmonary symptoms.

Von Winckel(28) cites a peculiar case of reflex neurosis in the form of an extremely tormenting dryness of the mouth, apparently induced by a myomatous uterus. The reflex was rectified by the proper surgical treatment.

Shauta and Pick,(29) Joseph,(30) Hintzmann,(31) Winfield,(32) Kaposi(33) all cite cases of retroflexed uteri, inducing some affection of the skin as an only symptom.

Kehrer(34) cites a case of disturbance of the voice, hoarseness and aphonia in a woman, aged thirty-eight, which had resisted every available local and systemic treatment. A gynecological examination disclosed a uterine retroversion. Replacement of the uterus was accompanied by return of the voice. Repeated experiments, in the form of removing the pessary, resulted in the immediate return of the trouble. Finally, wearing the mechanical support corrected the trouble.

The obstetrician has frequent opportunities to note obturator, anterior crural and sacral plexus irritations in his work. The leg cramps of the second stage of labor and the tetanic contraction of thigh and calf muscles are simply the outery of an irritated anterior crural or long sciatic nerve. Reliable authorities in this branch of our profession have described various types of immediate or deferred nerve irritations.

Lloyd(35) speaks of paralysis of the peroneal nerve manifesting itself a week or two before delivery, and mentions among the older writers who discussed the subject, Charpentier, Churchill and Romberg, and he also cites veterinarians who

have observed paraplegia as a complication of puerperal metritis in lower animals. Among the authorities quoted are Galle, Sewell, Ithen, and Imbert-Gourbeyre. They recognize two causes—traumatism and inflammation.

Hervieux,(36) Mills,(37) Bianchi,(38) Hunermann,(38) Nicholson,(40) Burr,(41) Hirst,(42) Good and Davisson,(43) in valuable papers, cite cases of leg cramps, paraplegia, or some other form of nerve manifestation occurring in obstetrical work, either as a result of pressure or septic extension to the nerve sheath. Thus, in gynecological work and obstetrical practice, we have compression and sepsis, giving distant reference of an intrapelvic trouble.

I have notes of many cases operated upon for adnexal or septic infection, whose referred pains persisted, to my embarrassment, for weeks and months after the careful removal or correction of intrapelvic lesions. Still vivid in my memory is a case of vaginismus in a nullipara, aged twenty-seven, which was severe enough to induce a marked dyspareunia, suffering with an adherent retroflexed uterus and enlarged prolapsed ovary, to whom I promised prompt alleviation, by a Baldy operation upon the uterus and correction of the tuboovarian trouble. The patient's nerve manifestations persisted for months after operation, until a series of Nabothian gland enlargements were tapped.

I was led to make a protracted investigation of the nervous system of the genital organs of women by having many cases of persistent sacral plexus or other intrapelvic nerve irritations continue after the removal of dermoid cysts, broad ligament masses, pyosalpinx and ovarian enlargements.

The advice of Mayo, Murphy, Oschner, Moynihan, Boldt, and other leading surgeons, viz., the early getting up out of bed of the patient after severe operations, is contraindicated in the face of nerve manifestations of intrapelvic troubles. The patient needs rest. Wier Mitchell's method in a modified form should be used after all intraabdominal gynecological operations. Making a grandstand play to the patient's friends in the presence of extensive and protracted intrapelvic troubles in women is rather poor postoperative procedure. The operation is simply the removal of the cause of the symptoms that induce the patient to submit to an extensive operative procedure. Degenerated nerves demand aid and time for regeneration.

Landois,(44) in speaking of nerve irritability, states that

insufficient nerve nutrition precedes nerve irritability. He further states that the physician should constantly bear in mind that the treatment should be along the line of restorative remedies, not depressing measures, whenever he encounters evidence of increased nerve irritability in patients whose nerves have been subjected to the influence of defective or disturbed nutrition, which irritability may be manifested in various ways, such as general nervousness and irritable weakness.

Using as a guide the points contained in this article, which has not much original material in it, but a vast amount of summarization of widely scattered medical literature bearing upon the subject, we should be extremely careful to weigh the nerve features of our patients, together with the pathological state of the female genitalia, before promising prompt relief after operations.

A gynecological examination is not complete without a careful examination of the sacral plexus, which is best located through the rectum. A sensitive state of this plexus, or other intrapelvic nerves, prohibits a promise that the irritating symptoms will promptly disappear after operation—the symptoms which frequently induce a woman to submit to the trying ordeal of a severe operation.

Time, tonics, eliminatives, rest, and an assurance of ultimate success on the part of the surgeon, are the remedies needed.

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TWISTED PEDICLES.

BY

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(With five illustrations.)

ANY tumor within the female pelvis or abdominal cavity, having a pedicle, is liable to rotation. The more complete the rotation, the more severe are the clinical manifestations and the graver is the prognosis.

The frequency of the occurrence of twisted pedicle is very

much underestimated. Shauta's statistics show that it occurs in 20 per cent. of ovarian cysts, and Rokitansky in 12 per cent. of cases, and that it is the cause of death in 6 per cent. It is quite remarkable the varieties of pelvic tumors that are subject to torsion, and as small tumors are most frequently involved in axial rotation, the first symptom of their presence may be manifest only when the pedicle becomes twisted. Not only are tumors of the ovary subject to this accident, but also par-ovarian cysts, hydrosalpinx and pedunculated subperitoneal fibroids. Olshausen reports that of ovarian tumors, dermoids are the most frequently involved. Dr. Edmund C. Bevers reports two cases of twisted pedicle of fibromyoma of the broad ligament.*

The symptoms vary in severity according to the degree of torsion of the tumor and the resulting twisting of the pedicle. The pain is cramp-like in character, intermittent in appearance if the rotation is slight and the position of the tumor such that it is able to readjust itself to its original position. These intermittent torsions may extend over many months or years until an acute strangulation may occur, or an acute torsion may come suddenly and be the first manifestation to the patient of an existing pathological condition. These sudden seizures are most violent in their clinical manifestations, are characterized by intense abdominal pain, accompanied by nausea and vomiting, and followed by the symptoms of acute peritonitis.

A group of these interesting cases have recently come under my observation and surgical treatment, and present a number of valuable features that are worthy of record.

CASE I.—*Acute torsion of an enormous hydrosalpinx of the right side simulating acute appendicitis, complicated by a four months' pregnancy. Operation. Recovery.*

Mrs. V. L., American, aged twenty years, married four months; gave the history of a four months pregnancy. She had always been in good health until June 20, when she retired feeling in her usual health. She was awakened at 2.30 A. M. with sharp pains in the right side of the abdomen, attended by nausea and vomiting. The pain continued extremely intense for two days and her physician, Dr. Boldemann, was called. The patient was found to be four months pregnant, had a temperature of 101° and pulse of 140, with excruciating pains throughout the entire right side of the abdomen which was so tender that she could not bear the slightest pressure. The tenderness was diffuse over the whole abdomen but more marked on the right side. There was such rigidity of the abdominal

* *The Lancet*, 1909, vol. i, p 536.

muscles that it was impossible to outline the abdominal contents. Upon digital examination, a sensitive mass could be felt on the right side of the pelvis, beside the pregnant uterus. Next morning her temperature was 100° and pulse 130; the pain was slightly diminished, but otherwise the condition was the same. The patient was taken to the Memorial Sanatorium where I saw her in consultation. Immediate operation was advised. The patient presented the clinical picture of a diffuse peritonitis, with intense suffering, nausea and vomiting, and the facial expression characteristic of peritonitis. It was impossible to map out the abdominal contents owing to the rigidity of the abdominal muscles. She presented all the symptoms of an acute attack of appendicitis and was prepared for operation and the abdomen opened late that afternoon.

A longitudinal incision was made at the outer border of the

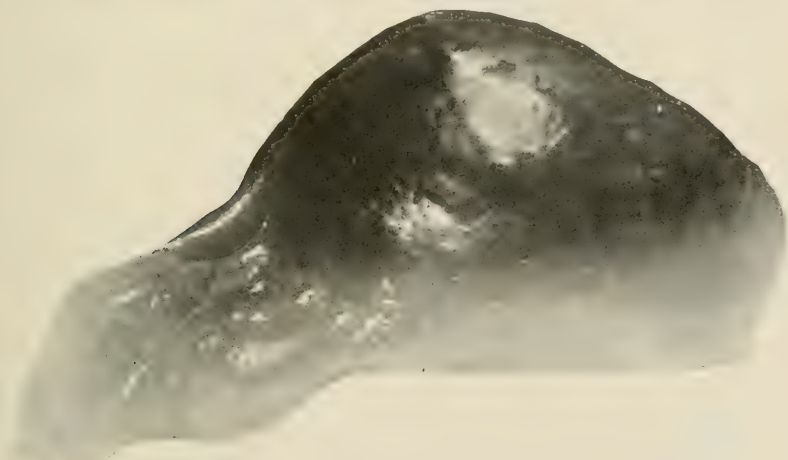


FIG. 1.—Strangulated hydrosalpinx as described in Case II.

right rectus muscle over the seat of most intense pain. The pregnant uterus presented in the lower angle of the wound, with a black tumor mass beside it. The tumor was found to extend up into the abdominal cavity, transversely and down on the left side, with the uterus resting upon it. The incision was enlarged above and below and the hand passed in and the tumor lifted out. It was found to originate in the right broad ligament and was an enormous hydrosalpinx with pedicle twisted from right to left four times. It filled the abdomen in its full transverse width. It was untwisted and the pedicle ligated with catgut and the tumor removed. Examination of the abdominal contents showed the intestines agglutinated with fresh adhesions, and all the evidence of an acute peritonitis. Further examination was discontinued to avoid trauma of the pregnant uterus. The incision was closed

without drainage. The patient made a good recovery and pregnancy was uninterrupted, the patient going to full term and being delivered of a normal living child five months later.

The pathological specimen was that of a strangulated hydrosalpinx showing large hemorrhagic areas in its walls. It contained a clear, blood-stained fluid.

CASE II.—*Twisted pedicle of a left hydrosalpinx. Acute strangulation, followed by diffuse peritonitis. Operation. Recovery.* (See Fig. 1.)

Mrs. McM., American, aged forty-seven years, married twenty-one years; nullipara. She gave the history of always being well until 1901, when she had an attack of sharp pain in the left ovarian region. These pains had occasionally recurred, more noticeable lately. On August 15, in the early morning she had worked hard, cleaning house and sweeping the sidewalk, after which she had pain in the left side. The pain increased in severity and by 12 o'clock it was so intense she called in her physician, Dr. Stone, who gave her a hypodermic. Notwithstanding the morphine, the pain increased in severity. I was called in consultation at 11 P. M. the next day and found the patient's temperature 102° and pulse 120, with all the evidence of a diffuse peritonitis. It was impossible to map out the abdominal contents, owing to the extreme sensitiveness and muscular rigidity. Digital examination showed a very sensitive mass filling the pelvis to the left of the uterus. Immediate operation was advised and accepted, the operation taking place at midnight.

The operation was performed at the Memorial Sanatorium, August 16, 1909. A median incision was made in the linea alba. When the abdomen was opened, free bloody serum was found, and in the upper extremity of the wound, a cystic tumor, dark and almost purple in color, presented. The descending colon was enormously distended. The incision was enlarged at the upper and lower angles. The abdominal contents presented the appearance of acute diffuse peritonitis. The tumor, the size of a small cocoanut, was found to be a hydrosalpinx springing from the left side of the uterus with the pedicle twisted from left to right several times, and involving the descending colon. The pedicle was untwisted and ligated and the hydrosalpinx, with the ovary of that side, ablated. Examination of the right side showed the appendix normal, the right tube elongated and a hydrosalpinx the size of three fingers occupying the distal third. The fimbriae were obliterated. The cyst and right tube were removed, leaving the ovary, which was normal, in position. The uterus was covered by adhesions. The stumps were inverted and the usual abdominal closure took place. There was an unusual reaction, and it was several days before the temperature fell to normal, after which, however, the patient made an uninterrupted recovery and was discharged from the sanatorium in three weeks.

CASE III.—*Twisted pedicle of a dermoid cyst of the right side with recurrent attacks of partial strangulation and peritonitis. Diagnosed as appendicitis by several physicians. The case was complicated by a dermoid of the left ovary. Operation. Recovery.* (See Figs. 2, 3, 4.)

Miss M. T., American, aged twenty-one years, unmarried, stenographer. Menstruation at thirteen years, occurring every twenty-eight days, and lasting three to four days; scant, dark, clotted flow with occasional cramps in abdomen. Had always had good health except for measles, typhoid and scarlet fevers. Her illness dated back to October, 1909, when she had her first attack of so-called appendicitis, with pain in the lower quadrant

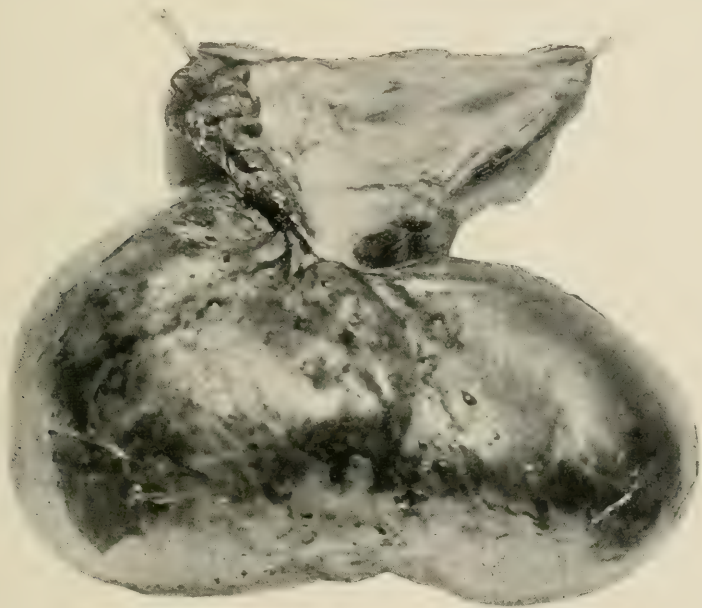


FIG. 2.—Dermoid of right ovary with twisted pedicle, Case III.

of the right side and crampy pains through the whole abdomen, and nausea and vomiting. The right side was very sensitive to pressure. The attack lasted about three weeks. On December 18 she had another attack, crampy pains through the whole abdomen, nausea and vomiting. Temperature normal. She recovered from this attack and the pain subsided until February 12, when she had another attack of crampy pains, nausea, and pain in the right side. She was confined to her bed. By February 24 the pain was very severe, accompanied by a great deal of nausea. She was cared for by her attending physician, Dr. Boldemann, who sent her to the Memorial Sanatorium February 25 for operation. After entering the sanatorium, she was seized with one of her acute attacks at 5 P. M.; very

severe pain, temperature 101.6° and pulse 120. The pains were crampy in character, extending throughout the abdomen, great faintness, nausea and vomiting. The abdomen was tympanitic, tense and rigid and extremely sensitive; pulse weak and soft. The patient was unable to make the slightest motion on account of the intense pain. Leukocytosis was 16,300. She presented all the clinical symptoms of a profound peritonitis. The situation was so grave it was considered inadvisable to operate. She was placed under close observation, food was withheld, hot turpentine compresses were applied to the abdomen. The conditions improved and in the course of the next few days the temperature fell to 99° and pulse to 80, with gradual subsidence of her symptoms, the diffuse tenderness disappearing with distinct localization in the right lower quadrant of the abdomen. On examination, an indurated mass could be outlined extending from the right anterior superior spine of the ilium to above the umbilicus and across the abdomen on the left side midway to the left anterior superior spine. Vaginal examination showed the uterus lifted up and pushed close behind the pubes, and the pelvis filled with a hard immovable mass. The leukocytosis rose to 20,500 the day after she entered the sanatorium but gradually subsided until the day of the operation, when it was 12,700.

The operation was performed March 9, 1910, two weeks after entering the sanatorium. A median incision was made from below the umbilicus to the pubic hair line. A large indurated area was found occupying the entire right quadrant and extending over beyond the median line. The parietal peritoneum was adherent to the underlying mass and separated with extreme difficulty, it being almost impossible to penetrate it at any point. The hand was finally inserted on the left and adhesions freed, and a dark mottled mass was delivered from its bed of adhesions upon the cecum. It was found to be a dermoid cyst closely resembling in appearance a pyosalpinx. The cyst lay transversely, with pedicle twisted many times from right to left, the constriction point being one inch from the right cornu, firmly bound by adhesions. The bands of adhesions were cut and further twists were found, showing separate twists with separate layers of adhesions for the different twists. When the pedicle was completely untwisted it was ligated and the tumor ablated one inch from the right uterine cornu. Further examination showed the pelvis to be filled with another tumor with the Fallopian tube overlying it. It was firmly bound over its entire surface to the pelvic tissues and accurately fitted the pelvic cavity. The adhesions were gradually broken up digitally and the tumor lifted with great difficulty from its bed of adhesions. The pedicle was ligated and the tumor ablated. The whole pelvis, uterus and cecum were covered by dense adhesions. The pelvis was sponged and the omentum brought down to cover the denuded surfaces. The parietal

layer of the abdomen was greatly ecchymosed and thickened. The abdomen was closed without drainage. The patient made a slow but good recovery.

Pathological Report.—The specimens consisted of left and right ovarian dermoids. Right dermoid: Weight 420 gm. Length of tube 10 cm. Length of dermoid 14 cm., width 8 cm., breadth 6 cm. Capsule 1 cm. in thickness, tough, elastic, tense. Interior showed two separate compartments, each filled with sebaceous matter containing long blond hair. Compartments of equal size. Left dermoid: Weight 600 gm., circumference 31 cm., capsule also tense, fibrous, 1 1/2 to 1 cm. in thickness. Filled with sebaceous matter containing long blond hairs.

CASE IV.—*Parovarian cyst with twisted pedicle firmly bound down to uterus and accompanied by a peritonitis and persistent hemorrhage. Operation. Recovery.*



FIG. 3.—Right ovarian dermoid incised to show sebaceous masses *in situ*, Case III.

Mrs. B. D., aged twenty-one years, nullipara, bookkeeper. Puberty at twelve years, menstruation every thirty days, lasting five to six days. Painful menstruation, nausea and vomiting, requiring patient to be in bed for two days. Her menstruation came on March 7, with the usual clinical manifestations but the flow continued for four weeks. The patient, who was under Dr. Boldemann's care, was brought to the Memorial Sanatorium April 14, 1910, for the persistent bleeding. The uterus was cureted and a small amount of debris removed, resembling chorionic villi. Digital examination revealed a large mass posteriorly and to the left of the uterus. On opening the abdomen the tumor mass was found firmly adherent to the posterior wall of the uterus. When separated and delivered it was found to be a parovarian cyst lying across the pelvis, with a twisted pedicle. It had become fused upon the uterus. There was great engorgement of all the pelvic vessels. The

pedicle was ligated, the tumor removed, and the usual abdominal closure made. The patient made an uninterrupted recovery.

Pathological Report.—The specimen consisted of a left parovarian cyst, left ovary and tube. Weight 292 gm., circumference 26 cm. and 20 cm. The cyst wall was very thin and translucent, covered by a delicate tracery of engorged blood-vessels. The tube was coiled over the cyst and adherent throughout its entire length. Extensive adhesions.

CASE V.—*Left parovarian cyst with a number of attacks of*

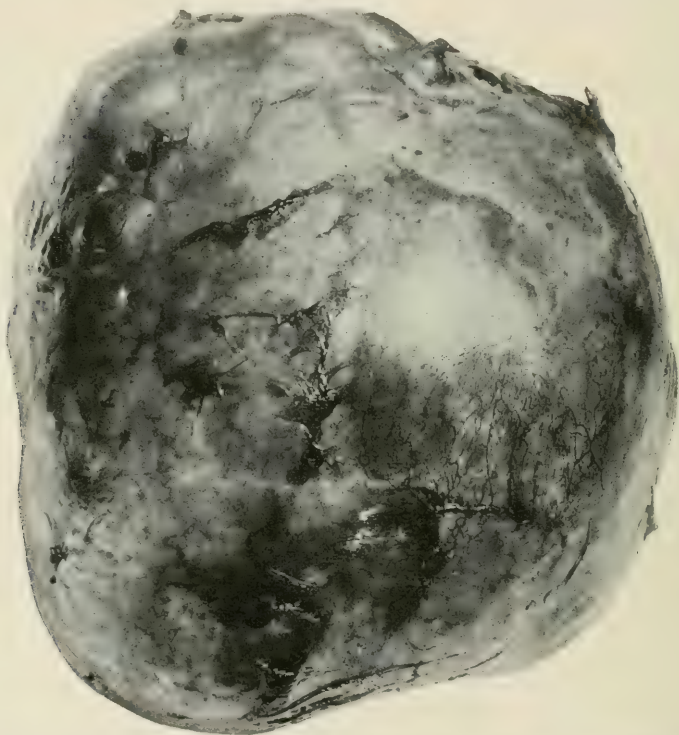


FIG. 4.—Left ovarian dermoid showing adhesions over entire surface, Case IV.

partial strangulation. No peritonitis. Operation. Recovery. (Fig. 5).

Miss B. M., aged eighteen years, clerk. Menstrual history: Puberty at thirteen years, menstruation every twenty-eight days, lasting about seven days, painless. The patient was a strong, well-developed girl; she had always been well until May, 1909, when she occasionally had slight pain in the left ovarian region. In May, 1909, she had an attack of severe knife-like pains in the left ovarian region. A doctor was called and made a diagnosis of retroversion. He placed her under

an anesthetic and inserted a pessary. On December 15 she had another attack of knife-like pains lasting all morning and into the next day, intermittently. Other attacks recurred in February and March. These attacks were always most intense agonizing pains, crampy in character, coming on in paroxysms,



FIG. 5.—Parovarian cyst of the left side with intermittent strangulation of the pedicle, Case V.

but after several hours of suffering and when the pain ceased, the patient felt as well as before the attack. These attacks were not associated with menstruation but came on after unusual muscular exertion, such as swimming or reaching. May 9, 1910, she began to menstruate and felt perfectly well until

9 A. M., when, on arising, she felt slight left-sided pain with bearing-down sensation followed by one of her severe attacks of pain. The pains came in paroxysms, cramp-like, sharp and cutting. Her sufferings were so intense it was necessary to give her a hypodermic. Digital examination showed a small uterus in normal position with a movable tumor to the right of the uterus. It was difficult to map out the tumor distinctly as the patient was very stout with rigid abdominal walls. A diagnosis was made of tumor with twisted pedicle, and operation was advised.

The patient was operated upon on May 14, 1910, at the Memorial Sanatorium. A median incision in the linea alba was made, the peritoneum entered, and just below the incision was found the twisted pedicle of a cystic tumor of the ovary. The tumor was found lying on the right side of the uterus but springing from the left side, freely movable, no adhesions. The tumor was cystic, tense, with engorged capillaries. It was delivered and found to be a parovarian cyst with greatly elongated pedicle twisted to the right twice and encircled by the Fallopian tube, the fimbriæ of which were free and spread out on the cyst wall. The distal pole of the left ovary formed part of the cyst wall. The pampiniform plexus was greatly engorged with cord-like vessels. The pedicle was untwisted and marked ecchymoses found in the ovarian ligament one-half inch from the ovary and on the posterior surface of the broad ligament and on the tube where the torsion was greatest. The pedicle was ligated by interlocking sutures of catgut, and the tumor ablated. The right tube and ovary were normal. The usual abdominal closure was made and the patient made an uninterrupted recovery.

Pathological Report.—The specimen consisted of left parovarian cyst, left ovary and left tube. Weight 340 gm., circumference, 23 cm. and 27 cm. Length of tube, 23 cm. Cyst wall, smooth and tense, with engorged vessels. No adhesions. Left ovary normal, left tube greatly lengthened, fimbriæ free and spread out on the cyst wall.

CASE VI.—*Left parovarian cyst with twisted pedicle. Very severe dysmenorrhea. No adhesions. Operation. Recovery.*

Miss G., aged twenty-two years, school teacher, always enjoyed good health. Puberty at thirteen years; menstruation every twenty-eight days, lasting six days. Profuse flow, extreme pain, crampy in character with rigidity and cramps extending over entire body. Pain usually lasted about twelve hours. Examination revealed a tumor to the left and behind the uterus, which was in normal position. Median incision in linea alba disclosed a cystic tumor springing from the left broad ligament with twisted pedicle. The cystic tumor was about the size of an orange, with thin transparent walls, and an extensive supply from the ovarian blood-vessels. The pedicle was untwisted, ligated, and the cyst amputated, leaving the ovary, which was

normal, in position. The appendix showed evidence of chronic inflammation and was removed. The usual abdominal closure was made and the patient made an uninterrupted recovery.

Pathological Report.—The specimen was a parovarian cyst, partially collapsed, appearing on first removal to be the size of an orange. The weight, after collapsing to approximately half the original size, was 70 gm. The cyst wall was thin, translucent, and, in areas between the delicate network of blood-vessels, transparent. Contents: Clear, albuminous fluid, specific gravity, 1008. The cyst was partially encircled by the Fallopian tube, with free normal fimbriae.

An analysis of these six cases of twisted pedicles show the underlying pathological condition to be one dermoid, two hydrosalpinx, and three parovarian cysts. In two cases, both hydrosalpinx, the strangulation was acute and complete and accompanied by acute peritonitis; in one dermoid, there were repeated twists with accompanying attacks of peritonitis. In two of the parovarian cysts, the strangulation was partial and recurrent, and accompanied by no peritonitis nor adhesions, while in the remaining case, that accompanied by metrorrhagia, pelvic peritonitis and adhesions existed. In the three cases of acute strangulation, the patients presented the appearance of a grave acute abdominal lesion. In none of these cases had the true condition been recognized, and in both right-sided cases a diagnosis of acute appendicitis had been made. It is in these cases of acute strangulation that an accurate diagnosis is demanded, that prompt surgical treatment may be given.

One point that must be borne in mind in making a differential diagnosis is that in the acute cases the physician is called in usually after an acute peritonitis has supervened, and, as in the majority of these cases, the tumors are comparatively small with long pedicles, the tumor mass may be carried completely out of the pelvis, and it may be impossible to outline it owing to the extreme sensitiveness and rigidity of the abdominal muscles. So that one of the points of diagnosis dwelt upon in the text-books, *i.e.*, increase in the size of the tumor, may be entirely undemonstrable.

The lesions most closely simulating acute torsion of a pelvic tumor, be it hydrosalpinx, parovarian or ovarian, are:

- I. Acute appendicitis.
- II. Ruptured tubal pregnancy.
- III. Intestinal perforation.
- IV. Acute intestinal obstruction.

In all these lesions, the onset is inaugurated by localized sharp acute pain, accompanied by symptoms of shock, followed by those of peritonitis. In a case of twisted pedicle, the pain of the acute strangulation persists, to a greater degree, is more acute, agonizing, paroxysmal and cramp-like than the pain of a diffuse peritonitis unaccompanied by a strangulation.

In ruptured tubal pregnancy or intestinal perforation, shock and collapse are more acute and profound. In intestinal perforation there is the history of the ulcer, and in the ruptured tubal pregnancy the menstrual history and the pelvic signs. In acute intestinal obstruction there is the inability to secure a bowel movement or the passage of gas.

In all these lesions the treatment must be the same if the patient's life is to be saved, *i.e.*, prompt surgical interference. In acute strangulation, the earlier the operation is undertaken, the less severe is the peritonitis with its accompanying adhesions, the simpler is the operation, and the milder is the postoperative reaction.

1519 SUTTER STREET.

COMBINED EXTERNAL AND VAGINAL VERSION.

BY

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THE correction of an abnormal fetal presentation by art during the later weeks of pregnancy or labor itself constitutes one of the most valuable of our obstetric procedures. Its execution may be easy of performance in certain cases while, in others, the retraction of the uterine walls render such an attempt extremely dangerous to the mother. As in other obstetric operations, the prognosis of version depends upon the conditions present in the case, the time at which the operation is performed and lastly the skill and experience of the operator.

In the early days, the most popular method of turning was by internal manipulation. This was due to the fact that midwives had charge of the lying-in women and the male physician was consulted only when their endeavors proved inefficacious. The male physician, being called late, found the cervix dilated and the membranes ruptured so he introduced a hand into the uterus, sought for one or both feet, turned the fetus and extracted at once. Version was always the method of election in transverse presentation and in cephalic presentations when the indication for extraction was present.

Whether these women had been infected during a tedious labor, by the midwives during delivery or whether they were infected by the septic hands of the male consultant, the fact

remains that a large number of deaths followed these operations. The patient generally lost hope and the midwife her self-respect when she was unable to deliver and was obliged to call for help. In neglected transverse presentation, the male physician disliked to be called to deliver the fetus because of the extreme danger of uterine rupture.

While external version was taught by various early authors, notably Rueff, de Puyt, Flamand and Osiander, it was not until 1807 that Wiegand published his paper and popularized the method. External version was practised in order to avoid entering the uterine cavity and causing the mother to die of puerperal sepsis. The method was not indicated late in labor. It was generally practised during the later weeks of pregnancy. Primarily, external version was attempted in transverse presentation whereby the head was brought over the inlet so that forceps could be applied if necessary. Later, the breech was brought down. Still later, the head was substituted for the breech and *vice versa*.

With the advent of the antiseptic era, the popularity of external version waned and internal version again became the operation of election at the beginning of the second stage of labor. The mortality was reduced considerably but still many women suffered from sepsis and uterine laceration.

It has not been a common practice among the general practitioners of the present day to attempt external version during the last weeks of pregnancy. If a malpresentation is diagnosed before delivery, the patient is allowed to go into labor and the dystochia treated at that time. If a malpresentation is recognized during the first stage, it is customary to delay treatment until the cervix is fully dilated. Only exceptionally is Wiegand's version attempted at this time. The membranes frequently rupture early in these cases and the liquor amnii escapes before the conditions for internal version are present. Prolonged intrauterine pressure and the increased difficulty of the final operation are detrimental if not fatal to many children.

Wiegand's version is technically difficult in many instances. The operation demands an accurate diagnosis of fetal position, a moderately relaxed condition of the abdominal wall so that the fetal poles may be effectually grasped, and no marked disproportion between the fetal head and inlet. There should be no indication calling for a rapid delivery. The fetus must be movable and its lower pole not fixed or impacted in the

inlet. If the head is to be brought down in pregnancy, a normal pelvis is always preferred. The amount of liquor amnii may be so small that the version is impossible. Again in hydramnion or multiparity, the fetus may be so movable that it is difficult to maintain a correct position without rupturing the membranes. In primiparæ with hypersensitive, obese or rigid abdominal walls, the difficulties are greatly increased. Even under narcosis, the result may be negative.

It is a clinical fact that during the eighth or ninth month of gestation, those parts of the fetal body lying farther away from the inlet are more easily displaceable by external manipulation. This is especially true in the primiparous woman. The absence of bony support to the uterine fundus, the fact that the overlying muscles are thinner and are attached above to the movable ribs in contradistinction to the more immovable lower attachments and the greater accessibility of the fundus are noticeable. The great difficulty in performing external version, therefore, is our inability to displace the lower fetal pole or to manipulate successfully below the level of the umbilicus.

These technical difficulties have served to deter the physician from attempting to correct a malpresentation during pregnancy or the first stage of labor by external methods, and as a result many mothers enter labor with unfavorable presentations. The medical attendant is brought face to face during labor with various complications; prolapse of the cord or arm, premature rupture of the membranes and threatened asphyxia which are often the direct result of the malpresentation and commonly lead to fetal death or severe maternal injury when delivery is indicated before the conditions for extraction are secured. It would be a great step in advance if we could avoid conditions that threaten the child's life during the first stage and permit it to be expelled through the pelvis as a cephalic presentation in a space of one to three hours instead of turning and extracting by the breech in less than ten minutes.

The question arises whether it is advisable to correct every malpresentation found during the later months of pregnancy. Undoubtedly, many breech and shoulder presentations rectify themselves either by spontaneous rectification or spontaneous version. In fact, many a malpresentation has rectified itself spontaneously where Wiegand's version failed absolutely.

Von Franque found 5041 children presenting by the shoulder

in a series of 655,770 births (7.69 per cent.). B. S. Schultze stated that in the city of Hamburg, 236,050 children were born in ten years. Shoulder presentation occurred 1640 times (7.25 per cent.). This percentage includes all children measuring over 32 cm. in length. It is much higher than in England or America because of the greater rarity of rachitis and the better hygiene observed in the latter countries. Schultze claims that 4,000 children are lost annually in Germany from uncomplicated shoulder presentation and its treatment. A. Buecheler puts the figures at 2,000 but states that 400 mothers are lost from the same complication.

The fetal mortality is due directly to artificial extraction by the breech when the cervix and perineum have been imperfectly dilated and the pelvic connective tissues have not been drawn sufficiently out of the way. Extraction by the breech in a primipara is to be avoided wherever possible. In a recent study of the death of the mature child in labor, I found that in a series of 190 deaths extraction by the breech was performed sixty-five times. Death was attributed directly to difficulties in extraction in twenty-one out of twenty-nine primary breech presentations and in thirteen out of twenty-one extractions following version for shoulder presentation. Premature rupture of the membranes occurred in twenty-one breech cases and in eight, the child was killed by direct intra-uterine pressure.

Since we are unable to determine when an individual presentation will correct itself spontaneously, and since it is true that every woman should enter labor in as normal condition as possible, we should not trust Nature blindly to correct complications. A judicious supervision of the mother demands of the medical attendant that she enter labor without malpresentation or possible complications if he can prevent them by the assistance of his art.

It is possible to obtain a better purchase upon the lower fetal pole by inserting several fingers or a hand into the vagina. This fact was appreciated by Braxton-Hicks in 1860 when he published his first paper on combined external and internal version. He obtained credit for the combined method although many authors, notably Wiegand, Schmitt and Busch had formerly taught or practised the operation. A similar technic was employed by Hohl and Marmaduke Wright. Braxton-Hicks recommended that the operator pass one or more fingers

through the cervix to push away the presenting part from the inlet and to bring a foot down into the vagina, thereby rupturing the membranes and permitting the liquor amnii to escape prematurely. His description is as follows: "I will now proceed to describe the mode by which I effect podalic version. We will suppose a case where everything is natural; the os uteri dilated to admit one or more fingers, membranes perfect, and the face toward the right side. Having lubricated my left hand, I introduce it as far in the vagina as necessary in order to reach a finger's length within the cervix—sometimes it requires the whole hand, sometimes three or four fingers will be sufficient in the vagina. . . . The external hand then presses gently but firmly the breech to the right side; as it recedes, so the hand follows it either by gentle palpation or by a kind of gliding movement over the integuments (membranes), while at the same time the other hand pushes up the head in the opposite direction, so as to raise it above the brim.

. . . When the breech has arrived at about the transverse diameter of the uterus, the head will have cleared the brim and the shoulder will be opposite the os. That is pushed on in like manner as the head, and after a little further depression of the breech from the outside the knee touches the finger and can be hooked down by it."

It will be observed, therefore, that Braxton-Hicks attempted to perform version by pressing upon the presenting part through the membranes, if intact, and upon the completion of version, he ruptured the membranes and brought down a foot. The introduction of an entire finger through the cervix always seriously compromises the integrity of the membranes but their preservation did not seem of importance to Braxton-Hicks as he ruptured them purposely at the close of the version. In a later letter, he states that by his plan of operation "one can make a complete podalic presentation out of a cephalic with only one or two fingers in the os uteri." This author laid great stress upon the importance of passing two or more fingers through the cervix into the uterus to assist the external hand in turning and with this operation his name is intimately associated. In placenta previa, Braxton-Hick's version has long been recognized as a valuable method of treatment but in turning a cephalic or shoulder presentation to that of a breech in other than placenta cases, rupturing the membranes and allowing the liquor amnii to escape in the first stage is not

ideal obstetrics according to the modern view. Extraction by the breech in the primiparous woman is always to be avoided if possible. If the fetus is to be extracted by the breech, the membranes should be preserved until the cervix is dilated. Furthermore, the method of Hicks was only applicable in labor as the cervix was always partially dilated. In the twenty cases published in his paper, all the women were in labor.

We are aware that when Wiegand's version succeeds, it is often difficult to retain the fetus in its new position. When the fetus is so large that retention is easy, an external version is usually difficult or impossible. With the combined external and vaginal version, it is not only possible to perform version during the last weeks of pregnancy but also in labor when Wiegand's version has failed. The details of the operation differ from the method of Braxton-Hicks in important particulars; first, in not introducing the finger or fingers into the cervix and secondly, in not rupturing the membranes to maintain the new presentation.

The technic of the combined external and vaginal version is as follows: Given a breech presentation in a primiparous woman, where in the absence of certain complications it is always advisable to bring the head over the inlet. Wiegand's version is to be tried first and if failure results, the following technic is carried out: The patient is placed under anesthesia in order to dilate the perineum sufficiently to admit the hand and to permit effective manipulation through the lower uterine segment. When the soft parts are dilated, the four fingers are applied to the lower uterine segment *around, but not within, the cervix*. The breech is then gently pushed out of the inlet and forced to one side while the external hand crowds the head over to the opposite side of the uterus. As the breech rises in the abdomen, it is pushed upward by the hand externally while, at the same time, the head is forced toward the inlet. The internal hand aids the version by pushing on the breech, trunk and shoulder as they successively present over the inlet. The version is complete when the head rests above the inlet and the breech lies in the fundus. The longitudinal position of the fetus is now maintained by applying a closely rolled towel on either side of the trunk and securing them with a firm abdominal binder. In a few primiparæ and in those whose pelvic outlet is torn or relaxed, narcosis is seldom necessary. The danger of inducing labor by these manipulations is slight.

In five cases in which this method was used during pregnancy, narcosis was used in each instance with satisfactory results. The danger of dislocating the placenta is also slight unless the cord is short. The presence of liquor amnii greatly facilitates the version. No instance of fetal asphyxia was encountered. Experience has shown that a lower fetal pole regarded as fixed externally is rarely fixed when one hand acts intravaginally. By this method, *version is possible at any time after the thirtieth week* and the fetal position is better maintained as the child is better developed.

Another method of correcting a malpresentation is that of Schatz in transforming a face into an occipital presentation. This author attempted to correct the curve of the trunk by pulling the anterior shoulder upward and backward and pushing the breech toward the chin. If the face is fixed or engaged in the inlet, Schatz's method is impossible. This method has a limited field as the uterine and abdominal muscles offer too great resistance especially in the subnavel area where it is impossible to grasp the anterior shoulder properly while the posterior shoulder is not acted upon at all. In twelve trials, I have been able to correct the face but once and in this single instance, the face returned. It was possible to flex the trunk externally but the head remained deflexed in spite of manipulation. In the last case, however, it was possible to raise the face out of the inlet by pressure through the lower uterine segment and to so assist cephalic flexion that external flexion of the trunk produced the desired results.

During labor, the ease with which the child can be turned depends upon several conditions: the presence of liquor amnii, absence of strong and frequent uterine contractions and absence of retraction around the fetal body. These conditions are usually present in the first stage. The membranes at this time are unruptured and the fetus is movable to a greater degree than it is later in labor. The uterine contractions are not as severe nor as frequent as in the second stage and the child has not suffered from intrauterine pressure.

By the combined external and vaginal version, not depending upon the size of the os uteri, a malpresentation can be corrected at this time with comparative ease. The membranes are unruptured by the operation and the normal mechanism of labor is not interfered with. It is a general rule that the fetal prognosis becomes more grave when it is necessary to

wait a considerable length of time after turning before extraction is effected. This law applies, however, with less effect when the membranes are intact. The contained liquor amnii prevents a retraction of the placental site with resulting interference of the placental circulation. Direct pressure of the fetus against the placenta causing a premature separation during version is obviated to a great extent. Furthermore, the acquisition of a favorable presentation early in labor is a potent factor in preserving the membranes throughout the first stage and preventing the so-called "dry labor" and premature uterine retraction.

In one case of placenta previa marginalis with a cephalic presentation, the author was enabled to turn the fetus so that the breech presented above the placenta. Later, when the cervix permitted, the membranes were ruptured and the foot brought down with ease. In this instance, it was possible to avoid the more difficult and dangerous Braxton-Hick's version and the result was just as satisfactory.

CONCLUSIONS.

1. The combined external and vaginal version is not *dependent upon the size of the cervix* nor the degree of its effacement. The less the cervix is dilated, the easier is the operation in most cases provided the membranes are intact.

2. Owing to certain conditions of the abdominal wall and uterus, it is often impossible to correct a malpresentation during the later weeks of pregnancy by external methods alone.

3. A preliminary dilatation of the perineum in primiparae and the version itself does not tend to terminate the pregnancy.

4. But little difficulty was experienced in maintaining the fetus in its new position. In no case was a repetition of the maneuver necessary.

5. Danger of premature separation of the placenta during pregnancy is very slight. In no instance was there a perceptible change in the heart tones before and after the operation.

6. The proper presentation of the fetus should be obtained before labor begins. The question as to whether the head or breech is to present depends upon the conditions present.

7. The operation is much easier of performance before the membranes have ruptured. If the liquor amnii escapes dur-

ing the first stage, the version should be done immediately as, otherwise, the uterine walls may so retract about the fetal body in a short time that internal version is impossible and the child is lost.

8. The danger of premature separation of the placenta depends upon the degree of uterine retraction and the amount of liquor amnii *in utero*.

9. The danger of septic infection is reduced to a minimum as the hand does not enter the uterus.

10. In certain cases of placenta previa, the foot can be brought down to the inlet before the membranes are ruptured. It is easier to secure a foot than in the classical Braxton-Hicks' version.

COMBINED EXTERNAL AND VAGINAL VERSION DURING PREGNANCY.

CASE I.—Mrs. T., age twenty-five. Para-I. Was seen on March 14, 1908, two weeks before term. The attending physician had diagnosed a breech presentation and a small pelvis. The pelvic measurements were found to be as follows: IS, 21; IC, 23; BiTro, 29; Baud, 18; BiSch, 9; CD, 12 and CV, 10 cm. Generally contracted and funnel-shaped pelvis. The diagnosis was sacro læva transversa. The abdominal wall was thick and sensitive. This type of pelvic deformity always calls for a cephalic delivery if the child is to be saved. Wiegand's version was negative both with and without narcosis. It was impossible to displace the breech from the pelvis externally. I then passed the left hand into the vagina and applied four fingers around, but not within, the cervix. The breech was somewhat fixed in the inlet. Pressing upward through the lower uterine segment, I was able to lift the breech up and force it over to the left iliac fossa. Pressure was now made externally on the head and the fetus soon lay transversely. Continuing the movement, the head was brought over the inlet and the breech pushed into the fundus. After the version was completed, the position was O. D. A. The abdomen was supported by a firm binder. The patient was delivered spontaneously of a living child eighteen days later.

CASE II.—Mrs. C., age thirty-four. Para-IV. Was seen in consultation on April 6, 1908. Diagnosis sacro læva anterioris. Pelvis normal. Two children lost in previous deliveries in breech extraction. Large children. Last menstruation, July 23, 1907. Wiegand version attempted on three occasions but without result. Combined external and vaginal version in slight narcosis. The head was brought over the inlet and the new position maintained by a binder. The pregnancy

continued until April 30. Labor lasted eighteen hours. Delivery spontaneous. Cephalic presentation. Child living and weighed 9.6 pounds. Labor took place twenty-four days after the position had been changed.

CASE III.—Mrs. C., age twenty-eight. Para-II. Former labor terminated by high forceps, dead child. Deep perineal tear. Rachitic pelvis. CV-9.5 cm. Large pelvic outlet. Soft parts relaxed. Diagnosis: Scapulo læva anterioris. This patient was first seen April 8, 1908. Labor due April 15. Wiegand version unsuccessful. Narcosis. Combined external and vaginal version. The breech was brought over the inlet and the child maintained in position by towels and abdominal binder. Labor occurred April 21, 1908. The Karl Braun balloon was inserted into the vagina to preserve the integrity of the membranes until the second stage of labor. When the cervix was fully dilated, the membranes were ruptured artificially and the fetus extracted with moderate difficulty. The child was asphyxiated but recovered and lived. It weighed 8.4 pounds. Interval between version and labor thirteen days.

CASE IV.—Mrs. K., age thirty-four. Para-I. Placenta previa marginalis. Pelvic measurements normal. Diagnosis, O. L. A. Head at inlet. Slight hemorrhage. Cervix closed and un-effaced. This patient was placed under narcosis and the perineum dilated manually until the outlet permitted the passage of a closed fist. Working through the uterine segment (the placenta lay on the posterior and left wall) the head was pushed toward the left and the fetus turned by the combined external and vaginal version. The placenta offered but slight resistance to the version. The vagina was then packed with wet lysol cotton. Uterine contractions began in two hours. Tampon removed in six hours. Cervix dilated one finger. Nearly effaced. Retamponed. Second tampon removed in eight hours. Cervix dilated two fingers plus. Membranes ruptured at edge of placenta and a foot brought down without difficulty as it presented just above the placenta. Hemorrhage completely controlled. The cervix dilated in seven hours. Fetus extracted. Deeply asphyxiated but revived under the use of the tracheal catheter, Schultze swings and warm baths.

CASE V.—Mrs. S., Para-I. Simple flat pelvis. CV, 10 cm. Last menstruation March 4, 1909. Labor due December 12, 1909. Diagnosis: Scapulo dextro anterioris. Patient seen in consultation December 1, 1909. Uterus tense and rigid. Wiegand version negative. Under ether narcosis, the perineum was dilated sufficient to adm't the hand. Internal pressure was made on the presenting shoulder while the external pushed the breech toward the fundus. The head was brought over the inlet in six minutes. The patient was then placed in Walcher's position and by the Hofmeier-Fritsch ma-

neuver I tried to force the head into the inlet but without result. The position was maintained by the towels and abdominal binder. Labor pains began December 8, 1909. The head still presented. Labor lasted twenty-four hours. A living child was born spontaneously and lived. Labor took place seven days after the version.

COMBINED EXTERNAL AND VAGINAL VERSION DURING THE FIRST STAGE OF LABOR.

CASE VI.—Mrs. T. Para-V. Diagnosis: Sacro *læva* transversa. Pelvis normal. Labor in progress four hours. Breech high. Cervix dilated three fingers. Effacement complete. Perineum relaxed. Membranes intact. Without narcosis, the breech was displaced toward the left and the head was brought down to the inlet in five minutes. Fetal heart tones 140 per minute both before and after version. The fetus was delivered spontaneously six hours later. No asphyxia.

CASE VII.—Mrs. D. Para-III. Diagnosis: Scapulo *læva* posterioris. Pelvis normal. Cervix dilated two fingers. Complete effacement. Membranes ruptured one hour previously. Very difficult to perform external version. Combined external and vaginal version much easier. Head brought over the inlet. Position maintained with binder. Before version, heart tones 160; after version, 140 and strong. Child delivered three hours later. Normal delivery. No asphyxia.

CASE VIII.—Mrs. R. Para-I. Service of Cook County Hospital. Diagnosis: Scapulo *læva* anterioris. Pelvis normal. Cervix dilated one finger. Not effaced. Under narcosis the perineum was dilated and the combined external and vaginal version performed in six minutes. The pains ceased for two days. The head remained over the inlet without difficulty. When the contractions started up, the head descended to the pelvic floor and forceps were necessary to terminate the delivery. Child alive.

CASE IX.—Mrs. D. Para-II. Diagnosis: Mento posterioris. Rachitic pelvis. Cervix dilated four fingers. Complete effacement. Membranes ruptured two hours previously. Combined external and vaginal version. Breech brought down in twelve minutes. Insertion of the perforating metreurynter. Uterine cavity refilled with salt solution. Before version, heart tones 160; after version, 136; after refilling the uterus, 158. When the balloon was expelled, the fetus was extracted by the breech. Slightly asphyxiated. Revived.

CASE X.—Mrs. M. Para-IV. Diagnosis: Ossium parietalis anterioris (Naegele obliquity). Rachitic pelvis. CV, 9.5 cm. Moderate sized fetus. Cervix dilated four fingers. Complete effacement. Membranes ruptured. Wiegand version absolutely negative. Under complete narcosis, the head was pushed

upward toward the left and the breech brought down in eighteen minutes. The perforating metreurynter was inserted and the uterine cavity filled with salt solution. Fetus was extracted with difficulty. Moderately asphyxiated. The fetal heart tones varied but 26 beats per minute after the version; 150 before, 124 after.

CASE XI.—Mrs. S. Para-I. Diagnosis: Ossium parietalis anterioris (Naegele obliquity). Cervix dilated four fingers. Complete effacement. Membranes ruptured six hours previously. Wiegand version impossible. Combined external and vaginal version impossible. Internal version after manual dilation impossible. Embryotomy. In this case the operation came too late. The retraction of the uterus had increased to such an extent that any version would have been dangerous.

CONVERSION OF FACE INTO OCCIPITAL PRESENTATION.

CASE XII.—Mrs. C. Para-II. Pelvis normal. Diagnosis: Mento dextra posterioris. Head wedged in the inlet. Cervix dilated two fingers. Effaced. Membranes intact. Schatz's method negative. Baudelocque's method not tried as I wished to preserve the membranes. Under slight narcosis the entire hand was passed into the vagina and pressing through the lower uterine segment, the head was raised above the inlet. The head was flexed by pushing the occiput down externally and flexing the trunk. In two hours, the head descended into the inlet and the child was born in a forceps delivery six hours later. The operation was relatively easy and the fetus was not marked.

VERSION IN THE SECOND STAGE OF LABOR.

CASE XIII.—Mrs. H. Para-III. Diagnosis: Occipito laeva anterioris. Normal pelvis. Head at inlet. Slightly movable. Os dilated and cervix effaced. Membranes ruptured. Extraction was indicated because of the threatened fetal asphyxia. The left hand was introduced into the vagina and pushed up the head to the left. The external hand was applied over the breech which was brought toward the right. By keeping the vaginal hand practically out of the uterus, the child was brought into a transverse presentation. The internal hand then seized a foot easily and completed the version. Extraction followed immediately and a living child was born. In this instance the necessity of passing the internal hand to the fundus uteri was obviated. Intrauterine manipulation was limited to the seizure of a foot after it had been brought down within 2 inches of the inlet.

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THE NEED FOR FURTHER DEVELOPMENT OF THE
SURGERY OF THE UPPER PELVIC FLOOR BY
DIRECT (SUPRAPUBIC) APPROACH.

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I PROPOSE to illustrate this subject by reference to eleven cases of operation between January, 1909, and April 29, 1910, as follows:

FROM RECORDS OF BELLEVUE HOSPITAL.

Name	Age	Civil state	Admitted	Operated	Diagnosis	Discharged	Results
L. L.	35	Married	Nov. 10	Nov. 15	Prolapse of uterus	Jan. 13	Exam. Apr. 5. Uterus in good position. Complaints of pains in region of broad ligament; tenderness insignificant.
T. K.	35	Married	Jan. 12	Jan. 14	Retroversion of uterus with adhesions	Feb. 5	Exam. Apr. 5. Uterus in good position; no indurations around organs.
M. B.	40	Married	Jan. 25	Jan. 31	Retroversion of uterus	Feb. 23	Exam. Apr. 5. Uterus normal in size; slightly antiflexed. Induration around organs disappeared. Position ideal.
E. C.	25	Married	Jan. 29	Jan. 31	Retroversion of uterus	Feb. 23	Exam. Apr. 5. Uterus in good position standing; drops to first position lying down.
M. McL.	26	Married	Feb. 17	Feb. 18	Retroversion uteri with adhesions	Mch. 10	Uterus in good position; no tenderness; slight thickening about region of broad ligaments.
A. C.	28	Married	Feb. 16	Mch. 4	Retroversion uteri	Mch. 23	Uterus in normal position. To return for observation.
M. D.	24	Married	Mch. 18	Apr. 1	Retroversion uteri with adhesions	Apr. 22	Three weeks since operation. Uterus in good position. Some exudate and tenderness behind.
B. F.	25	Single	Apr. 4	Apr. 11	Retroversion of uterus with adhesions		Case in ward now. Too early for report.
M. D.	38	Married	Apr. 25	Apr. 29	Prolapse uteri with adhesions and chronic salpingitis.		Case in ward now. Too early for report.
M. M.	50	Widow	Nov. 18	Nov. 22	Prolapse of vagina and stump of cervix. Cystocele and rectocele	Feb. 10	Patient had a panhysterectomy in 1893. Tissues in pelvis indurated and adherent. Discharged improved.

One was a case of complete prolapse or procidentia.* Two were cases of partial prolapse, the cervix resting at the ostium vagina. Five were cases of retroversion with adhesions, etc. Three cases of retroversion without adhesions, and one a case of prolapse of the pelvic floor subsequent to a hysterectomy some years prior. None of the cases being little more than a year's duration (since operation) and some a few months at best, we must withhold conclusions as to ultimate results for some time yet. Meanwhile we can consider the operation, *first* as to its necessity, and *second* as to the manner of its performance.

The necessity for some such operation I believe to be conceded by a large majority of workers in gynecological surgery. The operation is based on the conception of the pelvic floor as a structure of double formation, with an outer or lower floor, made up of muscle and its encasing fascial coats, and an upper or peritoneo-fascial structure. The accessibility of the lower floor has enabled us to restore it—the inaccessibility of the upper has led us to indirect lines of approach, and to more or less incomplete or inadequate measures for its restoration, or to measures which lend to organs, needing support, the aid of suspension.

The men who forty years ago gave so much time to the pessary were fully alive to the needs of the situation, they had already largely solved the rôle of the pelvic floor, for on finding that repair of all parts then within reach gave incomplete results, they worked out the pessary and its mechanism. They called in additional uterine support. In reality a support to the upper pelvic floor, a further necessity in ptosis of the uterus.

Let any one on opening the lower abdomen of a normal nullipara, pass the right hand to the bottom of the pelvis, place the index and middle finger astride the broad ligament close to uterus, press them down until they rest upon the peritoneal reflections passing forward to the bladder and backward toward the sacrum. With the fingers of the left hand in vagina outline the levator ani muscle, especially as it passes to right and left of this canal, then press upward to contact with fingers of other hand. There is an intervening loose space and an upper plane of resistance. This is the upper floor and its main structure is the peritoneum. Between the muscle below and the peritoneum above is that area of cellular tissue you so well

*Trans. Am. Gyn. Soc., 1906, page 144.

know. Whence its embryonic origin we know not, its actual function is evident on any dissection. The condensations of this tissue along blood and lymph vessels and nerves, and along the ureter, its concentration about and attachment to the viscera it encompasses give it the same relative strength and importance that belongs to the mesentery, and what it undertakes to do for pelvic organs it adequately performs so long as it is in normal condition, and position.

The accidents of parturition and of genital infection all too often prevent this—so that in various ways it departs from its normal condition and position.

Suppose an antecedent relaxation of the pelvic tissues from inflammation or subinvolution; and I refer not merely to the subinvolution of pregnancy, but to that of menstruation as well. The woman stands, works, strains. Bear in mind that the attachment of the principal lines of condensed tissue, perivascular and ureteral referred to above, is from above downward, and from behind forward, following the outward or peripheral trend of the structures they envelop, the line of yielding of the floor is forward and downward, the lower segment of the uterus is swung forward and downward, the broad ligament holds the upper part backward, gradually the anterior face is turned upward, the intraabdominal pressure plays uninterrupted upon it and retroversion is complete.

Such being the mechanism an operation must be devised to meet it.

We must work at the upper layer just as our predecessors did upon the lower. Knowing the shortcomings of the various plans of suspension we must abandon them and concentrate our minds on the fundamental aspect at the upper floor. We must not be deterred from the direct approach. We must realize how little shock is involved in work between bladder and uterus. We must work out the relative value of the supports through vessels and that from the peritoneum. (This latter not so much a support as an opponent of intraabdominal pressure.) So that we meet gravity by restoring the true supports, and intraabdominal pressure by taking up the slack in the peritoneal expansion upon pelvic floor.

As to the manner of performing the operation, on upper pelvic floor, from above, in cases of retroversion, it is merely a part of that already placed before you a year ago.

The need for preliminary treatment in all cases is imperative.

On page 144, Transactions of American Gynecological Society, 1909, is an illustrated article on the operative treatment of prolapse of the uterus. The degree of prolapse represented in retroversion is, of course, far short of that represented in procidentia, but the operation for the one passes into that for the other, the two being but different phases of one condition.

The essential thing in both operations is exposure of the uterovesical region. Where the operation is to be as extended as a procidentia would call for, the coils of small intestine should be lifted from the pelvis and held back by means of gauze pads. The patient must be in the Trendelenburg posture. In procidentia more or less separation of the bladder from the vagina is necessary. In retroversion this is not the case. In retroversions the small intestines may or may not be removed from the pelvis, as the operator may determine; it being unnecessary if the space between the uterus and bladder can be kept cleared without it. The Trendelenburg posture may or may not be necessary, depending upon the case. As a rule, a shallow pelvis permits an operation more readily than a narrow and deep one. A moderate Trendelenburg posture is recommended. The intestines must be removed from the anterior pelvic culdesac, and held back by gauze pads. The peritoneum is slit longitudinally from the beginnings of its loose attachment on the anterior face of the uterus to its reflection upon the bladder. This peritoneum, with the immediate subjacent fascia, is then gently stripped back as far as the space, just outside the vagina right and left. The uterus can now be caught between the thumb and two fingers (the thumb in front and the fingers thrust into the culdesac of Douglas) and drawn up into the opening. If the uterus cannot be seized as above described it is caught with a double tenaculum just above the uterovaginal junction in front and then drawn upward and backward. The lateral columns of the vagina are now brought together along the median line by three or four medium-sized sutures of kangaroo tendon. The first suture is placed about on the level of the external os or lowest point of the cervix. The last is placed just above the uterovaginal junction. They enter the cellular tissue just at the lateral vaginal wall, are buried in the outer portion of that wall, brought out about one-quarter of an inch from the point of entrance, pass off to the opposite side of the vagina, and are there entered and brought out into a position corresponding to the point of entry.

The veins, of course, will be involved, but as the venous anastomosis is very extensive in this region, no inconvenience will follow. The uterine artery is easily averted by palpating it between the thumb and forefinger thrust down astride the corresponding broad ligament. The ureter is too far removed from the region involved in the operation to cause embarrassment. Blunt dissection will quickly reveal the exact nature of the tissue included in the suturing. The effect of these three or four interrupted sutures placed as designated will be to take up the slack in the lateral and posterior supports of the uterus and upper vagina, and in so doing meet the essential defect in cases of retroversion. The next step is to take up the slack in the peritoneal reflection between the bladder in front and the uterus and broad ligaments behind. This is done with chromicized catgut. The extent to which the peritoneum is drawn in toward the central line is governed by the amount of inward traction required to take up any slack which may remain after the subperitoneal sutures in the vagina have been tied. This inner traction of the peritoneum tends to draw the round ligaments and inner face of the broad ligaments inward. The question, therefore, has presented itself to me whether the slack in the peritoneum in the uterovesical fold above mentioned might not be better dealt with by shortening the round ligament. Such a step will take up a good part of the slack and perhaps it might be found a proper way to deal with this part of the problem. It has the advantage also of tilting forward the fundus where the uterine body is very soft, especially in such cases in which, owing to this softening, the uterus bends easily, and falls forward or backward, in response to any impetus it may receive.

In concluding let me emphasize the value of preliminary treatment in retroversion. In many instances, especially the unmarried presenting no symptoms, it needs no treatment; but when it does, curetting and associated care is most helpful, and in certain cases in which there is no change in position of lower segment of uterus (marked retroflexions) in most instances it is all that is needed.

THE PATHOLOGICAL DIAGNOSIS OF INCIPIENT
CARCINOMA OF THE UTERUS.*

BY

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(With three Plates.)

THE diagnosis of incipient carcinoma and the mode of its propagation, are matters concerning which there is still a wide variance of opinion. The purpose of this paper is to offer a contribution to this subject, as determined by the study of three cases.

CASE I.—Patient, forty-six years of age; married. Father and mother died of cancer. Patient complained of malodorous discharge and bleeding after intercourse.

Physical Examination.—July, 1909: External genitalia of a multipara, a gaping urethral orifice and a moderately lacerated perineum. The portio vaginalis was irregular in form, both cervical lips showing an erosion about 1 cm. broad, which bleeds on slight manipulation. The external lip is somewhat rugged and presents the appearance of a small mucous polyp. On the basis of these findings the patient was advised to undergo a radical operation. This she refused. The vagina, adnexa and parametrium revealed nothing abnormal. The uterus was retroverted and freely movable. The diagnosis of "Malignant Degeneration of an Erosion" was made, and the suspected portion of the posterior lip was excised.

Histological Examination.—A section through the excised portion of the cervical lip showed numerous typical erosion glands except at two points (Fig. 1). These presented in parts a many layered atypical condition of the epithelium which at first sight appeared suspicious and on further investigation proved to be a typical carcinoma. Almost half the circumference of one of the glands (Fig. 2) showed a pronounced cellular richness of an atypical pavement epithelium, which stood out in marked contrast to the normal cylindrical cells of the gland at the periphery. The nuclei are irregular in size and shape, are markedly granular, are not surrounded by distinct membranes and are irregularly disposed. The pavement epithelium presents no basilar layer as seen normally, nor is it possible to say from these small areas and from this section alone whether this epithelium is of extraneous origin

*From the Second Frauenklinik, v. Rosthorn, in Vienna. Chief of the Laboratory: Prof. Schottlaender.

or has arisen from the glandular epithelium proper. The parenchyma is the seat of a mild chronic inflammation.

One month later, however, she returned and a complete abdominal hysterectomy was performed. The iliac glands were also removed. The vaginal cuff removed with the uterus measured 4 cm. long, presenting nothing special. The portio vaginalis is rugged, lacerated, showing on the posterior lip a mild fresh area of granulation and loss of substance (a, Fig. 3). (Site of excision?) The uterus measures $8.5 \times 5 \times 4$ cm. with a universally thickened serosa and a few perimetritic adhesions, particularly to the posterior aspect. The ovaries presented nothing abnormal.

Microscopical Examination.—The uterus was cut in a sagittal direction, and sections at various places were examined. The sections were stained with eosin and hematoxylin. Serial section was made of the cervix and the vaginal portion as well as the attached vaginal wall.

At the external os, close underneath the surface are a number of isolated solid carcinomatous alveoli, surrounded by dense zones of round-cell infiltration. The overlying surface epithelium can be traced upward toward the isthmus from this area, but with a broken continuity. The bare areas are replaced by scanty necrotic masses and considerable blood, which, therefore, in all probability represent the site of the preliminary excision. Following the cervical epithelium upward there appear numerous glandular formations lined by normally appearing pavement epithelium in contrast with alveoli which are easily recognized as carcinomatous. The latter lie relatively deep in the parenchyma and consist of large round or flattened cells; the nuclei show many mitotic figures. The epithelium, however, does not show the squamous construction. The alveoli are not completely solid but contain tissue gaps which are positively not to be explained by central destruction. On the surface of the cervical canal there are further manifestations of carcinomatous changes. The epithelium covering the surface resembles that of the vagina and portio. The deeper layers, however, reveal significant changes: the cells are indefinitely outlined; the nuclei are irregular in size and shape, are strongly granular and intensely stained. Here and there the process has invaded the deeper tissue so that the cervical glands appear to be surrounded by the process. The picture presents another feature of note, namely: a narrow zone of undoubted lymphatic spread of the carcinoma (b, Fig. 3). This zone is parallel to the surface epithelium in some sections (Fig. 4) and after branching in various directions is connected with the overlying epithelium.

The parenchyma shows a marked round-cell infiltration, diffuse and scattered, and in superior parts, several superficially seated carcinoma alveoli, which pass directly into the glandular or into the surface epithelium. The surface epithelium is

either single-layered or many-layered, and shows no atypical cell changes.

The anterior wall of the cervix, isthmus, and corpus show nothing in the least suspicious of carcinomatous changes.

The iliac and hypogastric glands show no carcinoma.

The vaginal parenchyma presents nothing abnormal, except for here and there a slight epithelial inflammatory infiltration.

CASE II.—A. M., age fifty. Married. Patient complained of profuse bleeding since her last menstruation, a year ago. Several times in the course of the last year she bled for periods lasting fourteen days. The last attack occurred five weeks ago and was ushered in with pain and lassitude; the bleeding continued three weeks and required tamponade and irrigations.

Physical Examination.—Vaginal examination revealed a broad and low portio vaginalis, with blood and coagula escaping from the external os. The cervix and internal os permitted the passage of a finger. The uterus was of the size of a three months pregnant uterus and presented at its right border a very prominent hard tumor. Parametrium free. Adnexa on the right side somewhat large, and sensitive to the touch.

The uterus was removed by the vaginal route by morcellation, together with the adnexa.

Macroscopical Examination.—A completely morcellated corpus was seen with tube on one side. When put together the various parts of the uterus measured approximately 15 cm. long by 9 cm. in diameter. The os was wide open, permitting direct inspection of the cervical canal which was irregular and appeared epidermized.

Microscopical Examination.—Sections of various parts of the uterus were made. The myoma was hyaline, edematous and contained tumor-like masses, probably of an endothelial origin (this waits further investigation). The tubes and ovaries presented nothing particularly abnormal.

The Cervix.—The original section was irregular in outline and presented structures which were first definitely orientated after serial section (Fig. 5). The section includes at its upper portion a small portion of the opposite wall of the cervix, and a part of the cervical canal.

Macroscopically the stained section shows the wide cystic dilatation of the glands and at the border corresponding to the two lips of the portio vaginalis some very small areas, the largest about the size of a pin head, which appear conspicuously dark stained (Fig. 5).

Serial sagittal sections of the entire cervix were made. The first section examined is shown in figure 5. The cleft (*a'*) represents the cervical canal, which as subsequent sections show becomes deeper and deeper and finally divides the section into two parts. (*C*) Represents distended cervical glands; (*d-d'*) represents the cut edges of the parenchyma. At (*a*) may be seen a group of cell nests, the largest the size of a pin-head,

of a carcinomatous type. These cell nests correspond to the anterior lip of the portio vaginalis, near the external os. On either side of this area, the portio is covered by erosions, both papillary and cystic.

The next section made at a deeper level is shown in figure 6. The cleft has deepened, and approaches a corresponding cleft from the opposing surface; between the two clefts isolated portions of the cervical canal (g) appear. The only other change of note is the disappearance of the cell nests on one side of the cervical canal.

The third section, shown in figure 7, simply shows the cervical canal completed and an entire disappearance of the cell nests.

Microscopical Examination.—The cervical canal (a) and glands (e) are epidermized by typical squamous epithelium. The cell nests ((a) Fig. 8) are composed of epithelial cells which show many evidences of atypical structure and conformation. The cells are irregularly polygonal with poor definition. The nuclei vary in size and shape, contain abundant chromatin and atypical mitoses, and in certain instances approach the giant cell variety. The cells are irregularly disposed, show a tendency to clump and show not the slightest tendency to assume a true squamous conformation. There is no connection between the cell nests nor did any of the sections reveal the slightest connection between the cell nests and the squamous epithelium lining of the cervical canal. On the other hand several sections showed a distinct connection between the carcinomatous alveoli and the epithelium lining the erosion glands immediately underlying them—an evidence of the malignant process developing upon the basis of a healing erosion. The parenchyma of the cervix shows as abundant infiltration with round cells.

CASE III.—A. B., age forty-one. Patient admitted to hospital for "prolapse." On examination: The cervix protrudes from the vulva. The external os admits a finger, and shows a right-sided laceration. The cervical canal is about 2 cm. long. The sound can be introduced for about 11.5 cm. The uterus is retroflexed and freely movable; adnexa free.

Vaginal fixation, anterior and posterior colporrhaphy, and amputation of the cervix were performed.

Macroscopically.—The cervix showed nothing abnormal except an epidermization of the glands.

Microscopical Examination.—The entire cervical canal and glands with the exception of one area to be described were epidermized with typical epithelium of the squamous cell variety. The only position of the cervix in which anything suspicious of carcinoma was noted, was found in a section from the posterior lip. Macroscopically the section is shown in figure (9) b. represents cervical wall and glands epidermized with squamous epithelium; c. represents the portion which is covered with simple erosions; d. represents an area denuded

of epithelium and covered by granulation tissue. At (a) the surface squamous epithelium is seen to dip into the parenchyma at a number of points. At two of these points the process is most marked.

The macroscopic appearance of these processes is shown in figure (9). While in most sections the dipping epithelium shows no variation from the typical squamous epithelium except in the matter of hyperplasia, at an area corresponding to ((f) Figs. 10 and 11) the epithelium shows distinct evidences of atypical structure and conformation. The cells vary greatly in size and shape and are indefinitely outlined: the cell bodies stain deeply with eosin; the nuclei are rich in chromatin, are irregular in size, and some possess even a giant nucleus. Abundant irregular mitoses are present. The cells have no definite arrangement, and simply appear loosely packed on the base of the club shaped process (Fig. 12). In addition, the parenchyma of the cervix is the seat of an extensive round-celled infiltration, more marked beneath the epithelium. There are many plasma and eosinophile cells and in the granulation tissue covering the denuded area (d) the nuclei show mitoses of the regular type.

To review briefly the results of the examination of the three cases we find:

CASE I.—An exploratory excision of a suspicious area of erosion on the posterior wall of the cervix was made in a patient who had bled after intercourse. The pathological examination confirmed the clinical diagnosis of malignancy. This was based histologically mainly on the peculiar atypical construction of the many-layered epithelium seen in two glands. Further investigation suggested that we were probably dealing with an adenocarcinoma which developed on the basis of a healing erosion. On examining the uterus, which was extirpated one month later, we found that the posterior wall of the cervix was the seat of a fully developed carcinoma. This was still confined to the mucosa. The lesion had apparently extended further upward during the interval between the first examination and the radical removal of the uterus. The portio, the anterior wall of cervix, and the corpus were entirely free from the carcinoma. The peculiar features about this carcinoma were the combination of 1. a surface deposit (suggesting the direct conversion of the cervix glands into carcinoma); 2. a certain limited area of lymphatic metastasis still confined to the mucosa and running parallel to the surface, while 3. the greater part of the malignant growth consists of isolated, more deeply seated, round cell-nests, which are embedded in a markedly infiltrated lymph zone.

These cells in contrast to those seen in the cervical tissue removed one month previous, *showed abundant atypical mitosis*. At the site of the exploratory section there was granulation tissue; carcinoma at this site could no longer be demonstrated; the glandular epithelium overlying the greater number of the

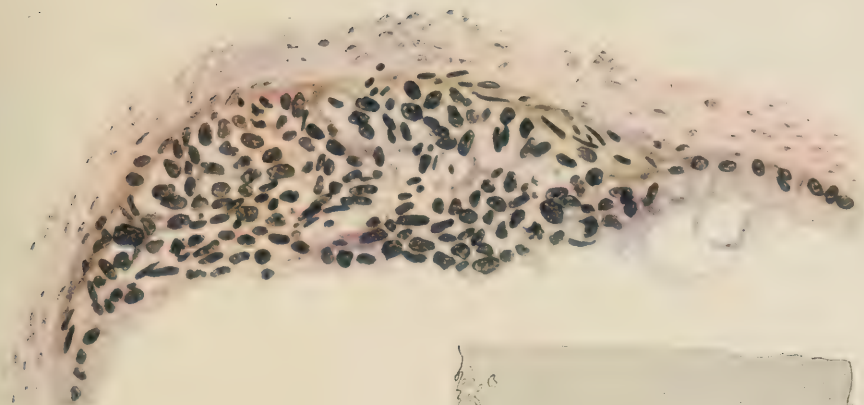


FIG. 2.

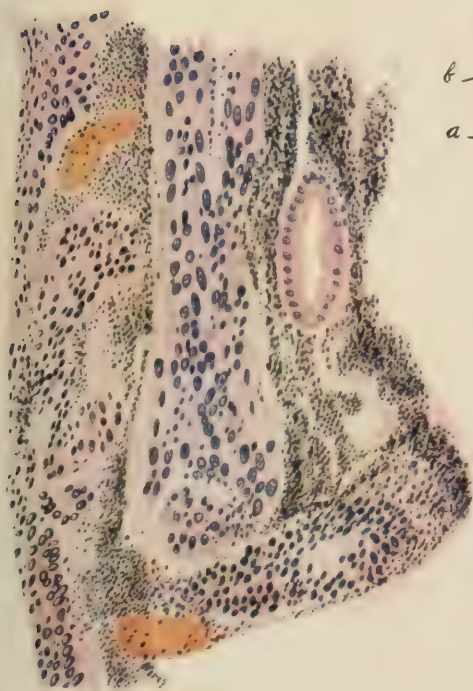


FIG. 4.

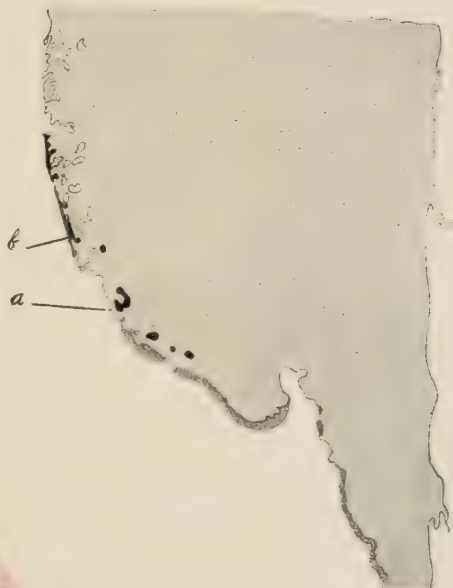


FIG. 3.



FIG. 1.

INCIPIENT CARCINOMA.—RUBIN.

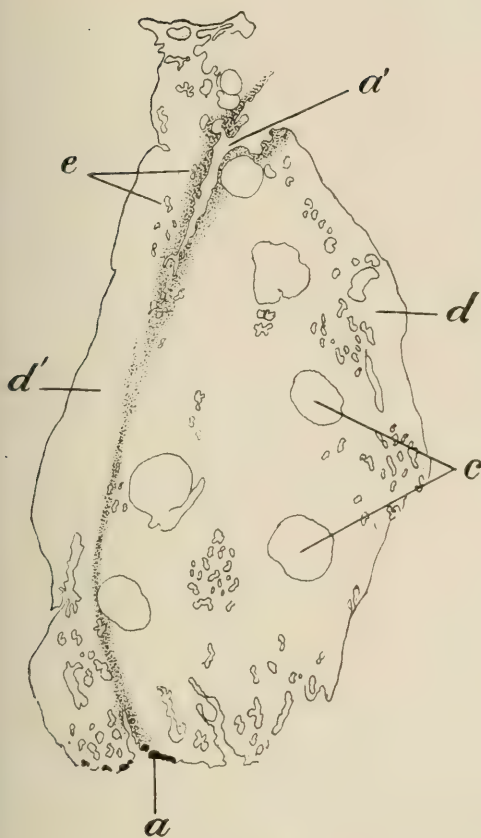


FIG. 5.

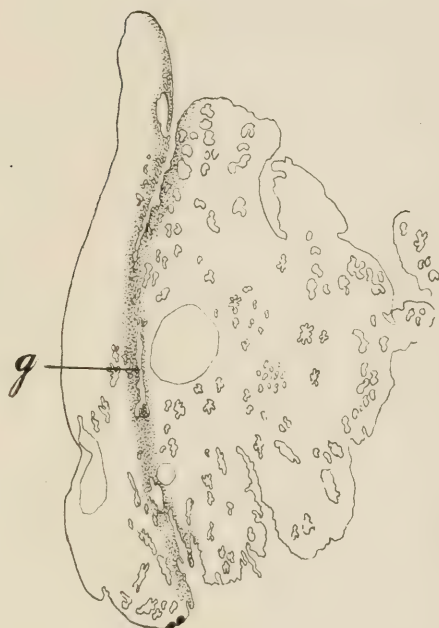


FIG. 6.

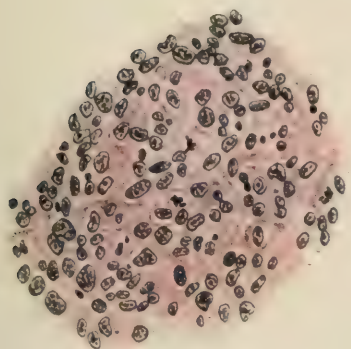


FIG. 8.



FIG. 7.

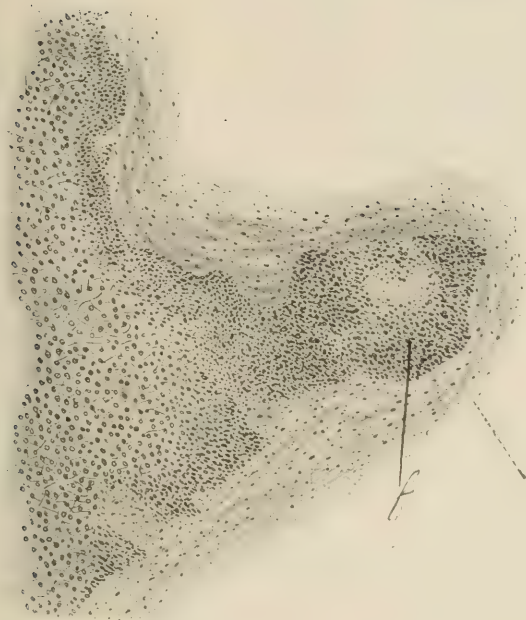


FIG. 10.

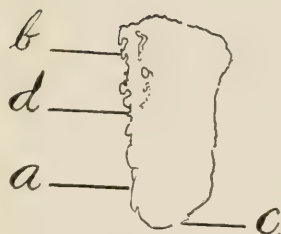


FIG. 9.



FIG. 11.

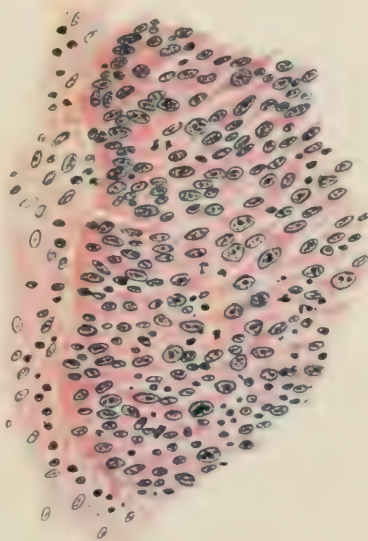


FIG. 12.

INCIPIENT CARCINOMA.—RUBIN.

cancer alveoli showed some stratification (simple benign metaplasia) but no atypical cell construction.

CASE II.—The uterus was extirpated for myoma. In the course of the routine examination of the cervix we encountered several foci on each cervical lip, of well marked atypical epithelium which, on serial section, proved to have no connection with each other. No other atypical foci than these were seen, nor was the normal portio epithelium anywhere in evidence. This had been replaced by erosion glands. We may assume, therefore, that an attempt at healing was going on. This growth, however, was far in excess of the metaplastic epithelium that is ordinarily seen in the repair of an eroded area. The cervical canal was lined with a simple, typical pavement epithelium (epidermization of the cervical canal). A transition between this epithelium and that of the foci on the vaginal portio was nowhere to be demonstrated. Irregular mitosis was seen in a few cells, but almost constantly the attention was engaged by the *conspicuous granulation* and the *giant nuclei*. This case suggests very strongly the possible multicentric origin of carcinoma of the uterus.

CASE III.—Examination of a cervix removed on account of elongation during a prolapse. Operation revealed 1. erosion formation and erosion healing at the vaginal portio; 2. the highest grade of inflammation of the stroma, probably gonorrheal in nature owing to the preponderance of plasma cells and eosinophile leukocytes; 3. considerable deep invasion and proliferation of the surface epithelium, particularly on the longer lip. In some of the first sections examined there appeared to be several isolated cell-masses in the depth of the parenchyma. But these cell-masses proved, in the course of the serial examination, to arise from and be intimately connected with the invading hypertrophied surface epithelium. In some portions of these hypertrophic epithelial prolongations there was a certain amount of aberration in cellular structure which suggested very strongly the pictures seen in carcinomatous alveoli.

These three cases exhibit together most of the changes in epithelium from 1. the simple metaplasia occurring in a healing erosion to 2. a more atypical epithelium that is on the borderline of malignancy and, finally, 3. the picture of a carcinomatous epithelium still in an incipient stage of its growth.

As to the Incipieny of a Carcinoma.—The pathological recognition of incipient carcinoma is still a matter of debate. Von Hansemann and Pick even go so far as to deny that it is possible. It is contended that either a case has developed to that stage where it permits of diagnosis or it has not, and therefore in the latter instance the carcinoma cannot be identified. In the first place it is obvious that, histologically considered, the carcinoma must have a beginning. The reason why we

cannot make an absolute diagnosis in the earliest stages of the growth is due to the fact that the material thus far has not been available. Most of the examinations have dealt with carcinomata that have been clinically suspected or macroscopically discovered. Routine examination of all material, suspected or otherwise, as has been carried out in the cases that I report, would open up possibilities of acquiring the necessary material for the study of the earlier phases of tumor formation. The greatest practical difficulty arises in deciding upon what criteria the diagnosis, especially as regards malignancy, shall be based. In other words: *What shall we regard as metaplastic, nonmalignant, epithelial changes, and what shall we regard as typical carcinomatous epithelium, or an atypical epithelium that will sooner or later develop into a full fledged carcinoma?* Unless we can decide upon the determining features of the diagnosis of a cancerous epithelium it is evident that we may never hope to improve our prophylactic therapy for carcinoma. The experience of the histologist counts for a good deal; where all the signs are present it is a comparatively easy thing to diagnose carcinoma. Where some alone are present this becomes more difficult. Where the signs said to be classical for carcinoma are absent in a given atypical epithelium the difficulty is naturally enhanced.

Case II and particularly Case III present those features that may be regarded as being on the border line. Both present changes in the epithelium that were discovered in the routine histological examination. Yet in view of the recent works of Schauenstein, Sitzenfey,⁽¹⁾ Schottlaender,⁽²⁾ and Pronai,⁽³⁾ I have been led to the opinion that we are dealing here with a possible beginning formation of carcinoma. In Case II the epithelium in the atypical foci in question shows the outspoken abnormalities in morphology that these authors have come to regard as the *criteria of carcinomatous epithelium*.

1. An indistinct uncertain definition of cell outline, particularly in the deeper layers (germinal, proliferating).
2. The presence of irregular, large, intensely stained nuclei, occasionally grouped in clumps.
3. No definite stratification, only partial parallelism of the basal cells (more often they are seen to be irregularly disposed, or at a slant toward the tunica propria).
4. The marked nuclear granulation. This sign deserves special attention because, according to Schottlaender,⁽⁴⁾

it is very frequently seen in carcinoma which has not yet undergone cornification.

Mitosis and cornification are such variable quantities that they may be omitted from the more important group of signs of marked cellular aberration. Case I of our series is a striking example of the variability of the mitotic manifestation.

The whole series of atypical epithelial proliferations observed in chronic inflammatory conditions with a many-layered construction and even process formation (or budding) can thus be distinguished from the cancerous epithelium. Nor can we accept the deep invasion of the metaplastic cervical surface epithelium into well-marked inflammatory stroma (Ribbert),(5) as in Case III, as pathognomonic for the presence of a carcinomatous process. Though these two signs were so well marked in Case III, we could not demonstrate the characteristic detachment of solid alveoli from the main stem, a sign claimed by these observers as a concomitant occurrence in this mode in incipient carcinoma formation. On the other hand, the detection of morphological changes in certain portions of the hypertrophic epithelium (Fig. 10, f) should rather lead us to suspect malignancy in this case.

In this connection we may quote Schauenstein's case, in which a primary squamous-cell carcinoma of the cervix has advanced entirely along the mucosa of the body of the uterus; also that of Sitzenfrey,(6) in which almost the entire surface lining of the uterine cavity was the seat of a squamous-cell carcinoma, while the deeper parts were the seat of an adenocarcinoma. This "Zuckerguss" form of carcinoma (Ruge) was also observed by v. Rosthorn and Schottlaender, either occurring alone or in combination with an infiltrating growth in which only part of the advance is along the surface. Pronai reports a similar case.

The diagnosis of malignancy in these instances must, therefore, rest upon the well-marked changes in the epithelium described above.

We must agree with Schauenstein, Sitzenfrey and Schottlaender (compare also Borst(7) in Aschoff's Pathology) that *the changes observed in the atypical cell proliferations constitute the most essential diagnostic signs of malignancy*. The tendency to deeper growth, isolation of alveoli, and associated inflammatory infiltrations are of secondary importance. These phenomena are observed in the benign processes, of adenomyometritis

for example, or in the nonmalignant invasion of the chorio-epithelial cells into the uterus (Robert Meyer).⁽⁸⁾

CONCLUSIONS.

1. The routine and complete pathological examination of parts or whole of the uterus, removed for whatever cause, may often furnish the first evidences of a latent carcinoma.
2. The pathological diagnosis of carcinoma of the uterus in the preclinical stage is possible.
3. The important criteria of malignancy in these early cases lie not so much in the relation of the cell nests to the stroma, the depth or extent of epithelial invasion, or evidences of surrounding inflammatory changes, as in the intrinsic morphology of the epithelial cells.

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8. Robert Meyer. Zur Kenntniss der benignen chorioepithelialen Zellinvasion in der Wand des Uterus. *Zeitschr. für Geb. u. Gyn.*, Bd. lviii, p. 98.
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REPORT OF THREE CASES OF PREGNANCY FOLLOWING SALPINGECTOMY.*

BY

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Brooklyn, N. Y.

THE vagaries of the fecundated ovum, in selecting a location for its development, and the persistence and penetrability of the spermatozoa in its effort to reach the object of its search,

*Read by letter, Section on Obstetrics and Gynecology, American Medical Association, June 7, 1910.

is well illustrated in the following histories, one of which shows that even after a double salpingectomy has been done, and the cornual portion of the tube excised, *it is still possible* for pregnancy to occur.

CASE I.—S. K., aged twenty-one, born in Austria, married three years, presented herself for examination on March 9, 1906. She had always been well until she married and became pregnant. She had had one child two years before, and no miscarriages. The birth was easy and she had remained in bed two weeks, but since that time she has complained of constant pain in the left inguinal region. Her menses occurred at sixteen, and recurred every twenty-five days. The period lasted four days, and was accompanied with cramps and backache on the first day, at which time the left-sided pain was relieved. She further reported that she had a profuse mucopurulent leukorrhea, and frequent and burning urination.

On examination we noted a laceration of the pelvic floor, a bilateral laceration of the cervix, with erosion, a left salpingitis, a cystic and prolapsed left ovary, and a tender appendix.

She was referred to the hospital, and was operated upon March 17, 1906, at which time the perineum was repaired, the uterus cureted, the left tube and ovary removed, and an appendectomy performed. Her recovery was uneventful.

In May, 1906, she again presented herself for examination, saying that she had felt perfectly well for about six weeks, when she had begun to have pain and a burning sensation in her right side. At this time she presented a tender right tube. After a few local treatments she was lost track of, and not seen again until June 1, 1909.

In the intervening three years she had borne two children, and now complained of pain in both sides, backache and an increased menstrual flow. Examination showed a marked relaxation of the pelvic outlet, a small anteflexed tender uterus, and an enlarged tender right tube. She was again referred to the hospital, the uterus cureted, the cervix amputated, the pelvic floor restored, and the right tube removed. Her immediate recovery was uneventful.

In October, 1909, four months later, she again appeared, having skipped two menstrual periods, and complaining of morning nausea. On examination, the uterus was found enlarged and anteflexed to the size of a ten weeks' pregnancy. The possibility of impregnation being questioned, she was asked to return again for subsequent examination, at which time the uterus showed further development, and a positive diagnosis of pregnancy was made. She had been attended in an uncomplicated labor by one of my associates.

CASE II.—The second case illustrates the migratory powers of the spermatozoa. R. S., a Russian, aged twenty-eight, was admitted to my service in the Jewish Hospital on May, 4 1908. Her previous history was as follows: Her menses had

occurred at twelve and recurred regularly every twenty-eight days until she married. She had had two children, both easy births, and five consecutive miscarriages following the birth of her last child. She had no surgical treatment for any of these abortions. Her last menstruation was on February 28, 1908. She had complained during March of pelvic pain, and had skipped her period. In April, a bloody vaginal flow appeared at the regular time, this metrorrhagia was irregular and was accompanied with intense abdominal pain, cramp-like in character, referred to the lower quadrant of the abdomen. She continued to have more or less pain for two days (April 27-28) which coincided with the occurrence of the bleeding. These symptoms were attended with several fainting spells.

On admission her hemoglobin was 55 per cent., and the red cell count 3,984,000. A tender mass was noted to the right and posterior of the uterus. A tentative diagnosis was made of "ovarian cyst with twisted pedicle, or unruptured ectopic." On operation the former diagnosis was confirmed. A small dermoid of the right ovary with the tube of that side was removed, care being taken to *excise* the uterine end of the tube well into the right cornu. This line of incision was closed with a continuous catgut suture, care being taken to close the uterine muscle and peritoneum over the tubal ostium. Her recovery was uneventful, and she was discharged from the hospital on June 1, 1908.

This same patient was admitted to my service in the Williamsburgh Hospital in September, 1908. She was in profound shock, pallid and pulseless at the wrist. Her abdomen was extremely distended, and dullness could be elicited in both flanks. Her rectal temperature was 102. Her history showed that she had skipped two periods, but had had no metiorrhagia up to the time she was seized with sudden and excruciating pain in the lower abdomen.

Vaginal examination was unsatisfactory, owing to the exquisite tenderness within the pelvis; the uterus, however, could be made out anterior to a pelvic fullness in the pouch of Douglas. The diagnosis of ectopic was made. Her condition was so desperate that my associate, Dr. Matheson, decided to defer the operation until reaction had occurred. She was placed in the elevated foot posture, kept at rest, and $1\frac{1}{2}$ grain of morphine given. Her hemoglobin was 40 per cent., but did not continue to drop. On the third day after admission, her condition was such as to permit operation, which was done by Dr. Matheson, who found the abdomen full of clotted blood, due to a ruptured interstitial pregnancy at the right cornu of the uterus. No active bleeding was going on at the time of the operation. The cornu was excised so that the musculature might be accurately coapted, and the hemorrhage controlled by deep interrupted sutures through the uterine muscle. The abdomen was closed in layers, and a smooth recovery followed. The point of interest in the case is: How did the fecundated

ovum migrate into the interstitial portion of the right tube, and develop there, when that tube had been previously excised, and the muscle and peritoneum closed over its abdominal ostium?

CASE III.—My third case was in a woman of twenty-six, who had been operated by a general surgeon. She had been married seventeen years and had never been pregnant, owing to a gonorrhea which she had contracted from her husband shortly after marriage. Both tubes had become infected, which infection necessitated their removal.

From the hospital records no description of the operative technic could be learned; it is presumed, however, from my subsequent findings, that the tubes had been ligated and ablated, and had not been excised.

On March 15, 1909, she was admitted to my service presenting the following history: She had menstruated regularly until January 22, 1909, which was her last period. No flow appeared in February, but on March 8 she had a severe attack of abdominal pain, which lasted several hours, and was followed by metrorrhagia. The pain and soreness which had continued to date became localized in the right lower quadrant. She had vomited with the onset of the pain, but had had no fever.

On admission she was pallid, the abdomen distended and exquisitely sensitive over the lower right quadrant. The pelvic examination was indefinite and unsatisfactory, extreme sensitiveness on moving the cervix being the only positive finding. A presumptive diagnosis of ectopic was made, which was strengthened by the blood examination, which showed 4,000,000 red, 24,000 white, and 65 per cent. hemoglobin. She was prepared for operation, and on the following morning, under ether narcosis, the culdesac was opened from below and the presence of free blood demonstrated. This confirmed the diagnosis. A right rectus incision was then made and the peritoneum opened from above. A large amount of dark clotted blood escaped. After packing off the intestines with a sterile gauze roll, the pelvic organs were exposed and an interstitial pregnancy of about eight weeks' development was found in the stump of the right tube, which was attached to the ovary of that side by adhesions. The confining sac was ruptured at several points, but no active bleeding was in progress. The gestation sac and the right cornu of the uterus were excised, and the uterine wound closed with interrupted sutures.

It was noted that the remains of the left tube, 1.5 cm. long, projected from the left uterine cornu. Time or the patient's condition did not admit of the resection of this tubal stump. A quart of saline solution was left in the abdomen, and the wound closed in layers. Her recovery was prompt and uneventful.

This case illustrates the possibility of tubal stumps becoming patent after ligation and ablation of the free and isthmic portions of the tube.

THE RESULTS OF A MODIFIED GILLIAM OPERATION FOR SUSPENDING THE UTERUS BY THE ROUND LIGAMENTS.*

BY

J. R. BROMWELL BRANCH, M. D.

Medical Superintendent Macon Hospital; Late Resident House Officer in Gynecology,
Johns Hopkins Hospital.

So much has already been written on operations for suspending the uterus, it is our desire not to add unnecessarily to the already crowded literature. We shall therefore confine this paper to a report of fifty-nine cases operated upon in the Gynecological Clinic of the Johns Hopkins Hospital, after a brief consideration of the requirements of the operation, and a description of the technic employed.

An ideal suspension of the uterus must do three things:

1. Keep the uterus in good anteversion, relieving the symptoms consequent upon the retroflexion.
2. Allow unrestricted development of the uterus necessary to the completion of normal pregnancy.
3. Resume its suspensory function after labor.

The old Kelly ventral suspension fulfilled admirably the first of these requirements, but did not meet satisfactorily the second and third. Holden (*AMER. JOUR. OF OBST.*, Vol. li, 1905, p. 469) has reported the results of this operation in 445 of our cases.

After two or three severe cases of dystocia following this operation, we abandoned it where there was a possibility of subsequent pregnancy.

The operation now done is modified from that of Gilliam, and is done as follows:

A small median abdominal or Pfannenstiel incision is made exposing the pelvic organs. A silk traction suture is passed through each round ligament about 3 cm. from the uterus. An important improvement, originating with Ferguson and revised by E. H. Richardson, has been recently adopted. A purse-string suture of catgut is now placed on each side beginning

* Read before the Georgia State Medical Association, Athens, April 21, 1910.

in the parietal peritoneum near the internal abdominal ring, including the portion of round ligament extending from the internal abdominal ring to the silk traction suture previously taken. This suture is tied later and closes up an open space through which a loop of bowel has been known to enter and become strangulated.

A sharp Halsted clamp is pushed through the rectus muscle, its posterior fascia, and peritoneum, grasping the traction suture, and by drawing it the round ligament is brought out and readily sutured to the *under* surface of the outer portion of the fascia of the rectus. Fine silk is usually used for this purpose, care being taken not to strangulate the ligaments by too sharp a kink. The ligaments are usually not crossed over to the opposite side, but sutured to the fascia on its own side. The catgut purse-string sutures previously placed are now tied and the incision closed in layers throughout.

We emphasize the importance: First, of the purse-string catgut suture; and second, the suturing of the round ligaments to the under surface of the rectus sheath, thus shutting off the peritoneal cavity from the exterior by strong fascial layers.

In some cases the vaginal outlet was relaxed and perineorrhaphy was also done.

The following questions were asked in letters sent to patients, fifty-nine replies were received, and the results are as shown below.

QUESTIONS.

1. How has your general health been since operation?
2. Have you had any pain such as you had before your operation here?
3. Do you have pain at your periods?
4. Do you have leucorrhea ("whites")?
5. Have you had any operation since the one here? If so, for what?
6. If married, have you had any children or miscarriages since leaving here?

Please give dates of labor or miscarriage if possible.

The patients may be classified as follows:

White.....	48
Black.....	11
Nulliparous.....	21
Parous.....	38

The results are:

Cured of symptoms.....	39 or 66	per cent.
Improved.....	8 or 13.5	per cent.
Unimproved.....	10 or 17	per cent.
Cured, but recurrence of symp- toms after labor.....	2 or 3.5	per cent.

In these cases there were twenty pregnancies:

Normal cases.....	15 or 75	per cent.
Forceps.....	2 or 10	per cent.
Miscarriages.....	2 or 10	per cent.
Long hard labor.....	1 or 5	per cent.

In two normal cases, which up to the time of labor had been cured of all symptoms of retroflexion, a recurrence of symptoms was noted, making the percentage 10 per cent. in twenty cases.

	White	Colored	Total	Nulliparous	Parous	Suspension	Suspension with R. R. V. O.
Cured of symptoms.....	30	9	39	16	23	27	12
Improved.....	7	1	8	1	7	4	4
Unimproved.....	9	1	10	4	6	5	5
Cured, but recurrence of symptoms after labor.....	2	0	2	0	2	1	1
Totals.....	48	11	59	21	38	37	22

From these results we are warranted in drawing the following conclusions:

1. Of the patients who have come to us to be relieved of the symptoms of retroflexion, a large majority are nulliparous white women.

2. That 66 per cent. are cured absolutely of their symptoms.

3. That 75 per cent. of subsequent pregnancies are normal.

4. That 10 per cent. suffer recurrence of symptoms after labor.

5. That the operation described is only fairly satisfactory, in that it falls short of fulfilling the requirements imposed upon it.

I wish to thank Dr. Howard A. Kelly for suggesting to me this arbeit, for the use of his clinical material, and for other assistance which has made this publication a possibility.

MISSED ABORTION AND LABOR.*

BY

FREDERICK A. RHODES, M. D.,

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1. FECUNDATION generally occurs in the tubes, the embryo remaining there for about five to seven days. It is stated by many writers that a large per cent. of cases of "missed labor" are not true uterine pregnancies but are extrauterine, the simulated labor pains being the effort to remove the fetus, these efforts not being effectual.

2. After leaving the tubes, the embryo lodges in the mucosa of the uterus where it becomes permanently located for some time. It is now quite agreed that the fixing of the ovum at the future placental site is not due to an implantation upon the mucosa, but that the embryo exerts pressure upon the epithelium and glands which are already proliferated. Atrophy and degeneration follow at this place, the outermost part of the thickened mucosa becomes the stratum compactum and the middle part the stratum spongiosum. The decidua or thickened mucosa develops about the ovum and contributes the maternal part of the placenta. The embedding, or sinking into the mucosa, occurs by erosion of superficial layers of the latter; the ovum is brought into relation with the deeper layers of the mucosa, the edges are undermined, so that the ovum is partly covered by mucosa, the area not covered being occupied by an organized blood clot.

3. The development of the fetus may be interfered with on account of any of the following conditions which if sufficiently severe, may produce death of the fetus, which is generally followed by the emptying of uterus within a few days.

These causes are:

Diseases of father.

Diseases of mother.

Diseases of child.

Diseases of placenta.

*Read and specimens presented at West Penn Medical Society, Pittsburg, December 10, 1909.

Father.—About the only disease the father can transmit to the child or placenta is syphilis, which disease stands first in list of all causes. Syphilis from the father does affect both the child and the placenta.

Mother.—Next to syphilis, inflammations of mucosa and metrium are evident causes of abortion, especially when influenced by severe exertion, physical and mental, traumatisms, etc. Prolonged high temperature in the mother is frequently followed by death of the fetus.

The child is liable to infectious diseases from the mother, to syphilis from father, and to disturbances of nutrition due to various causes.

Placenta.—Liable to traumatism, inflammation, hemorrhages, syphilis, degeneration, tumors, etc.

Williams describes five kinds of infarcts and adds:

“Still more rarely, scattered through the substance of the placenta, are seen red to almost black areas varying from bright red to almost black in color, and measuring from 1 to 3 cm. in diameter. They are apparently composed almost entirely of blood and are sharply differentiated from the surrounding tissue by a capsule which presents a more or less fibrous appearance. They may occur singly or in considerable numbers, so that occasionally the entire placenta is studded with them and presents a nodular surface, and on section an appearance which Pinard has aptly described as *placenta truffé*.”

These structures are also designated as red infarcts, though many authors prefer to speak of apoplexy or hematoma of the placenta.

They differ markedly in structure and appearance from the other form of so-called red infarcts, and probably have nothing in common with them.

4. The most favorable time for occurrence of abortion is between the second and third month or period of placental development unless it is during the first few days and is not recognized.

5. The cause which produces placental separation or direct death of the fetus is frequently sufficient to stimulate uterine contractions and result in expulsion; if it does not so act, the presence of a foreign body in the form of a dead fetus and membranes will generally result in the uterus being emptied.

6. Disease of the cervix, of the uterus proper, tumors, etc., may prevent the muscular contraction from expelling the fetus.

Pains cease and the contents are retained. As in abortion this is generally during the third month or at the end of pregnancy when, if the child is retained, it is called "missed labor." Frequently during pregnancy, when there are twins, one dies, the other continues to develop.

7. The cause of uterine contractions at the end of pregnancy, or term, is not satisfactorily explained. The emptying of the uterus is a physiological process at that time and cannot be explained better than why any particular function occurs at a certain time and to a definite degree—all physiologic acts being developed in cell evolution, to preserve the organism or for reproduction.

8. If the fetus is not expelled after death, when such occurs during development of fetus, or at term, one of several results may follow: These are absorption, mummification, maceration, calcification, etc.

Edgar states absorption cannot occur after ten to twelve weeks. During mummification the fetus may become as dry and thin as paper. The result of greatest consequence to the mother is maceration with putrefaction, many of toxic products being absorbed with sapremia, etc., developing.

If fetus or placenta remain in a dry state they are generally removed by uterine contractions at a future date, which time is very variable. They have remained in the uterus or abdomen for many years.

9. A diagnosis of death of the fetus before or after term is not always easily made. Unfortunately in a very large per cent. of cases, the physician is not consulted until long after death of the fetus, and he either finds what appears to be an abortion or labor in progress, or symptoms resulting from decomposition and absorption of uterine contents. A cessation of symptoms of pregnancy, especially when the mother presents symptoms apparently due to absorption of toxic substances, points quite clearly to death of the fetus. It is hardly probable that any symptoms may be experienced by the mother if the membranes remain unruptured.

10. *Treatment.*—When death of fetus is diagnosed the uterus should be emptied in best way possible, depending upon condition of mother, condition of cervix, and supposed condition of fetus at time of diagnosis. Opinions differ as to inducing labor, should pregnancy continue beyond nine and one-half months.

SPECIMEN 1.—This is a piece of a placenta, which had been in

the uterus ten months; size, about 10 cm. in diameter; very hard, and contained a number of large dark infarcts as described above in Section 3. Mrs. M. from whom I obtained the specimen states that pregnancy began October, 1908, and that the water broke April, 1909, with no pain. I was called August, 1909, and found upon examination an inevitable abortion. Within a few hours she expelled the above described placenta without any evidence at any time of having passed any fetal parts. According to her calculations the child died in April at sixth month, and as far as can be accounted for, it must have been absorbed.

SPECIMEN 2.—This is a one and one-half months' fetus delivered by Dr. Rectenwald after remaining in uterus nine months after its death.

SPECIMEN 3.—Fetus and placenta of four months' development. Remained in uterus one month after death. Delivered by Dr. Rectenwald.

CASE IV.—Mrs. B. took sick during fifth month of pregnancy and suffered a great amount of pain, nausea, etc., until end of pregnancy, when she was delivered by Dr. Rectenwald of a living healthy child at full term and a dead fetus of four and one-half months' development.

SPECIMEN 4.—Mrs. J. L., delivered July 2, 1908, in Passavant Hospital by Dr. Brenneman. He had seen her one week before for the first time. Was told she was nine months pregnant. Abdomen very small. No fetal heart nor movements. Some blood being discharged from vagina. Sent to hospital and delivered one week later. Fetus likely four months developed. Had been dead four or five months. No odor. Membranes and placenta delivered simultaneously. Father admitted old specific trouble. Became pregnant eight months later and was kept under syrup hydriodic acid. Was delivered of a healthy child one month ago. This placenta presented same kind of infarcts as shown in Specimen No. 1.

CASE VI.—Mrs. B. delivered by Dr. H. of a full-term child. One year later Dr. C. was called and found uterorectal fistula, parts of a dead fetus being discharged from rectum. This was one of twins, having remained in uterus one year after birth of other one.

KEENAN BUILDING.

CASE OF VERTEX AND FOOT PRESENTATION.

REPORT OF CASE.

BY

PERRY E. GILBERT, M. D.,

Linneus, Maine.

THE patient, Mrs. B., aged twenty-six, was delivered in March, 1908, of a dead child, her first, weighing eight pounds. The child presented O. L. A. After being in labor for about

sixteen hours, the pains had become ineffective and forceps were decided upon. The pelvis and vagina were both small and I had some difficulty in applying forceps. After the forceps were locked, they would not hold, slipping off the head every time. Finally I called the late Dr. Robert Boyd, who had had a very large obstetrical experience covering forty years. After a deal of hard work he succeeded in making his forceps hold. He stated that it was the most difficult application of forceps he had ever had.

On June 17, 1910, the husband came to me and said that an hour or two before Mrs. B. had had a gush of water from the vagina. At the same time he informed me that she was pregnant, expecting to be confined the last half of July, having last menstruated October 11, 1909. After some conversation regarding the case he decided I had better not see her at present, saying he would call me if anything new developed.

About 4 o'clock the next afternoon he came, saying that he guessed his wife was in labor.

Examination showed the head fairly well engaged, fetal heart 150, strong and heard most distinctly on the right side of the abdomen. The os was dilated so as to admit one finger, which came in contact with a hard substance, the vertex, no membranes intervening, and some digits, which I finally decided belonged to the right foot. Diagnosis, O. D. P. with a foot prolapsed.

The pains were coming at regular intervals of every five or six minutes and seemed to be quite strong. I decided to wait until dilatation was further advanced and then try to push the foot back. However, all such attempts were fruitless.

As dilatation proceeded, the presentation changed spontaneously from a vertex to a face, chin anterior, the foot still retaining its position. The pains gradually became weaker and finally lost all force. The fetal heart also became weaker and increased to 160 beats per minute.

Interference was decided upon and I sent for help to anesthetize. An attempt was made to restore the vertex presentation and failed. Forceps were then tried and although able to lock the blades easily, they slipped off. Remembering the experience of two years before, I abandoned the forcep and brought down the presenting foot; the other could not be felt at all. The version and delivery were not at all difficult, though the head was not extracted as easily as it might have been.

The cord was wrapped once around the left arm and twice about the neck.

The child was hardly asphyxiated, but after vigorous work for ten minutes finally cried lustily. It seemed to be a full-term child, despite the mother's statements that it could not possibly be over eight months. Its weight was four and three-quarter pounds.

The perineum was not torn.

The mother is a small woman, weighing about 110 pounds, and is five feet, one and one-half inches tall. Her pelvic measurements are, interspinous diameter 23.75 cm., intercrystal 25.8 cm., intertrochanteric 29.6 cm., external conjugate 20.5 cm., right oblique 24.5 cm., and left oblique 22.0 cm.

The mother made an uneventful recovery and was up and about the house on the thirteenth day. The child is living and seems to be healthy.

REVIEWS.

THE PRACTICE OF MIDWIFERY. Being the seventh Edition of Galabin's Midwifery, greatly enlarged and extended. By ALFRED LEWIS GALABIN, M. A., M. D., Cantab.; F. R. C. P., London; Late Fellow of Trinity College, Cambridge; Consulting Obstetric Physician to Guy's Hospital; Late President of the Obstetrical Society of London; Late Examiner in Obstetric Medicine to the Universities of Oxford, Cambridge, London, and New Zealand, and to the Royal Colleges of Physicians and Surgeons; and GEORGE BLACKER, M. D., B. S., Lond.; F. R. C. S., Eng.; F. R. C. P., Lond.; Fellow of University College, London; Obstetric Physician to University College Hospital and the Great Northern Central Hospital; Teacher of Practical Midwifery, University College Hospital Medical School; Examiner in Obstetric Medicine to the Royal Colleges of Physicians and Surgeons. 1124 pages. With 503 illustrations. New York, The Macmillan Co., 1910.

The first edition of this now classical work appeared in 1886, twenty-four years ago, since which time it has held a large and constant circle of friends. In this time it has undergone many revisions, its gifted author never neglecting to keep it in the front rank of progress. The present edition has been very thoroughly revised by the junior author, Dr. Blacker, and to a large extent is rewritten, especially in the chapters on the development of the ovary and the early ovum, the physiology of the fetus and of the puerperal state, the mechanism of labor, the lower uterine segment, the pathology of eclampsia, hydatidi-

form mole, accidental complications of pregnancy, narcosis in labor, vaginal and extraperitoneal Cesarean section, and pubiotomy. A new chapter has been added on injuries and diseases of the fetus. The style of the page has been altered and some two hundred pages with one hundred and seventy-four new illustrations added. Rejuvenated by the infusion of new blood and yet maintaining the characteristics which from the first made it popular, it will continue to hold its large circle of readers.

A MANUAL OF OBSTETRICS. By A. F. A. KING, M. D., Professor of Obstetrics and Diseases of Women in the Medical Department of the George Washington University, Washington, D. C., and in the Medical Department of the University of Vermont, etc. Eleventh edition, enlarged and thoroughly revised. 12mo., 713 pages, with 341 illustrations and three colored plates. Cloth, \$2.75, net. Lea & Febiger, Philadelphia and New York, 1910.

An eleventh edition of a medical book, even in this age of rapid change, can only mean that the work that attains it must possess to a high degree the characteristics essential to an enduring popularity; in this instance maintained by brevity and clearness without sacrifice of completeness. While the size of the work increases a little from one edition to another, the author succeeds remarkably in keeping it within the bounds first set, so that it maintains its value as a text-book for the elementary student and as a work of reference for the too busy practitioner. The more important additions to the present edition are on pubiotomy, spontaneous version by posture, and the factor of thigh pressure upon the abdomen considered as one of the auxilliary forces of labor. The section on hyperemesis has been rewritten. Thirty-nine new illustrations have been added.

DIFFICULT LABOR. A Guide to its Management for Students and Practitioners. By G. ERNEST HERMAN, M. B., Lond.; F. R. C. P., F. R. C. S.; Consulting Obstetric Physician to the London Hospital; Consulting Physician-accoucheur to the Tower Hamlets Dispensary; Late President of the Obstetric Society of London and of the Hunterian Society; formerly Physician to the General Lying-in Hospital and to the Eastern District of the Royal Maternity Charity; Examiner in Midwifery to the Universities of London, Oxford, Cambridge and Durham, the Victoria University, the Royal College of Surgeons and the Royal College of Physicians. 547 pages. With 180 illustrations. New York, Wm. Wood & Co., 1910. Price, \$2.50, net.

This is a new and enlarged edition from the fifth English edition. Many small additions have been made, necessitating the recasting of the entire work, while entirely new chapters have been added on retroversion of the gravid uterus and on eclampsia. As in the first edition, on reading over the work, one is impressed at once with three characteristics: first, that it is

eminently practical and direct; second, that it is thorough without diffuseness; third, that it is sufficiently peremptory and dogmatic in statement to carry conviction. Its author tells clearly and definitely what he thinks the best way of dealing with each complication of labor. There is much in the book of great practical value to every obstetrician.

MEDICAL ELECTRICITY AND RONTGEN RAYS. By SINCLAIR TOUSEY, A. M., M. D. W. B. Saunders Company, Philadelphia, 1910.

This book contains some very interesting chapters on static and dynamic electricity and their physiological effects, and is written in a plain and concise manner. Electrotherapy with its technic and indications is very satisfactorily given.

The Röntgen ray is covered exhaustively while radiography is rather hampered by technicalities. The frequent reference to the author's cellular diaphragm and intense metric scale give an exaggerated importance to these articles as being essential in obtaining good radiographs.

The radiographs in the illustrations are not uniformly good but special mention should be made of some excellent dental plates.

The book is well worth reading by those interested in this line of work. A. H. B.

HOOKEWORM DISEASE. Its Etiology, Pathology, Diagnosis, Prognosis, Prophylaxis, and Treatment. By GEORGE DOCH, A. M., M. D., Professor of The Theory and Practice of Medicine, Medical Department, Tulane University of Louisiana, New Orleans; and CHARLES C. BASS, M. D., Instructor of Clinical Microscopy and Clinical Medicine, Medical Department, Tulane University. With forty-nine illustrations and colored plate, pp. 250. St. Louis, C. V. Mosby Company, 1910.

A scourge of wide extent; few diseases surpass the subject of this work in the strangeness of their history, their importance, or their seeming ease of cure. In many parts of Europe hookworm disease is a most important economic problem; in our own country it lays a heavy load on a district that should be most fertile, but which through it is relatively uncultivated and whose population is most miserable. We now know that it is a preventable evil and must stop, and medical men, administrative officers and private philanthropy are working actively to that end. This book tells clearly what is known of the condition, its ravages, and the means to be used for its repression.

TRANSACTIONS OF THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION. Volume xxii. Edited by W. W. HAGGARD, M. D. Published by the Association, 1910.

This handsome volume of 561 pages contains the forty-three

papers and discussions presented before the twenty-second annual meeting of the Association at Hot Springs, Virginia, in December, 1909. They cover a wide range of subjects of great interest.

MEDICAL EDUCATION IN THE UNITED STATES AND CANADA. A report to the Carnegie Foundation for the Advancement of Teaching, by ABRAHAM FLEXNER, with an introduction by HENRY S. PRITCHETT, President of the Foundation. Bulletin number four. 576 Fifth Avenue, New York City.

There is no matter of greater importance to the medical profession and to the people of this country than that which forms the subject of this report, the first of a series of papers on professional schools to be issued by the Carnegie Foundation.

To make the fact of this importance plain we cannot do better than to quote somewhat freely from Dr. Pritchard's introduction. When the Foundation began its work, some five years ago, it soon found that a large majority of all the institutions in the United States having the name College, were really concerned with secondary education and that there was little unity of purpose or standards. Under these conditions the trustees felt themselves compelled to begin a critical study of the work of the college and of the university. Inevitably this scrutiny led to the consideration of the relations between the college or university and the professional schools which had gathered about it or were included in it. The confusion found here was quite as great as that which exists between the field of the college and that of the secondary school. Colleges and universities were discovered to have all sorts of relations to their professional schools of law, of medicine, and of theology. In some cases these relations were of the frailest texture, constituting practically only a licence from the college by which a proprietary medical school or law school was enabled to live under its name. In other cases the medical school was incorporated into the college or university, but remained an *imperium in imperio*, the college assuming no responsibility for its standards or its support. In yet other cases the college or university assumed partial obligation of support, but no responsibility for the standards of the professional school, while in only a relatively small number of cases was the school of law or of medicine an integral part of the university, receiving from it university standards and adequate maintenance. For the past two decades there has been a marked tendency to set up some connection between universities and detached medical schools, but under the very loose construction just referred to.

Meanwhile the requirements of medical education have enormously increased. The fundamental sciences upon which medicine depends have been greatly extended. The laboratory has come to furnish alike to the physician and to the surgeon a new means for diagnosing and combating disease. The educa-

tion of the medical practitioner under these changed conditions makes entirely different demands in respect to both preliminary and professional training.

Under these conditions and in the face of the advancing standards of the best medical schools it was clear that the time had come when the relation of professional education in medicine to the general system of education should be clearly defined. The first step toward such a clear understanding was to ascertain the facts concerning medical education and the medical schools themselves at the present time, and in accordance with this the present report is made.

No effort has been spared to procure accurate and detailed information as to the facilities, resources, and methods of instruction of the medical schools. They have not only been separately visited, but every statement made in regard to each detail has been carefully checked with the data in the possession of the American Medical Association, likewise obtained by personal inspection, and with the records of the Association of American Medical Colleges, so far as its membership extends. The details as stated go forth with the sanction of at least two, and frequently more independent observers.

In making this study the schools of all medical sects have been included. It is clear that so long as a man is to practise medicine, the public is equally concerned in his right preparation for that profession, whatever he calls himself—allopath, homeopath, eclectic, osteopath, or what not. It is equally clear that he should be grounded in the fundamental sciences upon which medicine rests, whether he practises under one name or under another.

The attitude of the Foundation is that all colleges and universities, whether supported by taxation or by private endowment, are in truth public service corporations, and that the public is entitled to know the facts concerning their administration and development, whether these facts pertain to the financial or to the educational side. It believes, therefore, that in seeking to present a fair and accurate statement of the work and the facilities of the medical schools of this country, it is serving the best possible purpose which such an agency as the Foundation can serve; and, furthermore, that only by such publicity can the true interests of education and of the universities themselves be subserved. In such a reasonable publicity lies the hope for progress in medical education.

The report proper is divided into two parts. In the first half the history of medical education in this country and its present status is set forth. The story is there told of the gradual development of the commercial medical school, distinctly an American product, of the modern movement for the transfer of medical education to university surroundings, and of the effort to secure stricter scrutiny of those seeking to enter the medical profession. The present status of medical education is then fully described

and a forecast of possible progress in the future is attempted. The second part of the report gives in detail a description of the schools in existence in each state of the Union and in each province of Canada.

It is the purpose of the Foundation to proceed at once with a similar study of medical education in Great Britain, Germany, and France, in order that those charged with the reconstruction of medical education in America may profit by the experience of other countries.

The striking and significant facts which are here brought out are of enormous consequence not only to the medical practitioner, but to every citizen of the United States and Canada; for it is a singular fact that the organization of medical education in this country has hitherto been such as not only to commercialize the process of education itself, but also to obscure in the minds of the public any discrimination between the well-trained physician and the physician who has had no adequate training whatever. As a rule, Americans, when they avail themselves of the services of a physician, make only the slightest inquiry as to what his previous training and preparation have been. One of the problems of the future is to educate the public itself to appreciate the fact that very seldom, under existing conditions, does a patient receive the best aid which it is possible to give him in the present state of medicine, and that this is due mainly to the fact that a vast army of men is admitted to the practice of medicine who are untrained in sciences fundamental to the profession, and quite without a sufficient experience with disease. A right education of public opinion is one of the problems of future medical education.

The significant facts revealed by this study are these:

1. For twenty-five years past there has been an enormous overproduction of untrained and ill-trained medical practitioners. This has been in absolute disregard of the public welfare and without any serious thought of the interests of the public. Taking the United States as a whole, physicians are four or five times as numerous in proportion to population as in older countries like Germany.

2. Overproduction of ill-trained men is due in the main to a very large number of commercial schools, sustained in many cases by advertising methods through which a mass of unprepared youth is drawn out of industrial occupations into the study of medicine.

3. Until recently the conduct of a medical school was a profitable business, for the methods of instruction were mainly didactic. As the need for laboratories has become more keenly felt, the expenses of an efficient medical school have been greatly increased. The inadequacy of many of these schools may be judged from the fact that nearly half of all our medical schools have incomes below \$10,000, and these incomes determine the quality of instruction that they can and do offer.

Colleges and universities have in large measure failed in the past twenty-five years to appreciate the great advance in medical education and the increased cost of teaching it along modern lines. Many universities desirous of apparent educational completeness have annexed medical schools without making themselves responsible either for the standards of the professional schools or for their support.

4. The existence of many of these unnecessary and inadequate medical schools has been defended by the argument that a poor medical school is justified in the interest of the poor boy. It is clear that the poor boy has no right to go into any profession for which he is not willing to obtain adequate preparation; but the facts set forth in this report make it evident that this argument is insincere, and that the excuse which has hitherto been put forward in the name of the poor boy is in reality an argument in behalf of the poor medical school.

5. A hospital under complete educational control is as necessary to a medical school as is a laboratory of chemistry or pathology. High-grade teaching within a hospital introduces a most wholesome and beneficial influence into its routine. Trustees of hospitals, public and private, should therefore go to the limits of their authority in opening hospital wards to teaching, provided only that the universities secure sufficient funds on their side to employ as teachers men who are devoted to clinical science.

In view of these facts, progress for the future would seem to require a very much smaller number of medical schools, better equipped and better conducted than our schools now as a rule are; and the needs of the public would equally require that we have fewer physicians graduated each year, but that these should be better educated and better trained. With this idea accepted, it necessarily follows that the medical school will, if rightly conducted, articulate not only with the university, but with the general system of education. Just what form that articulation must take will vary in the immediate future in different parts of the country. Throughout the eastern and central states the movement under which the medical school articulates with the second year of the college has already gained such impetus that it can be regarded as practically accepted. In the southern states for the present it would seem that articulation with the four-year high school would be a reasonable starting-point for the future. In time the development of secondary education in the south and the growth of the colleges will make it possible for southern medical schools to accept the two-year-college basis of preparation. With reasonable prophesy the time is not far distant when, with fair respect for the interests of the public and the need for physicians, the articulation of the medical school with the university may be the same throughout the entire country. For in the future the college or the university which accepts a medical school must make itself responsible for university standards in the medical school and for adequate support

for medical education. The day has gone by when any university can retain the respect of educated men, or when it can fulfil its duty to education, by retaining a low-grade professional school for the sake of its own institutional completeness.

If these fundamental principles can be made clear to the people of the United States and of Canada, and to those who govern the colleges and universities, we may confidently expect that the next ten years will see a very much smaller number of medical schools in this country, but a greatly increased efficiency in medical education, and that during the same period medical education will become rightly articulated with, and rightly related to, the general educational system of the whole country.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Suprarenal Capsules in Pregnancy and the Puerperium.—Luigi Sambalino (*Ann. di ostet. e gin.*, May, 1910) has made histological examinations of the suprarenal capsules in twenty-six cases of pregnancy observed by him in the Hospital for Women, in Florence. Of these, three women died of hemorrhage alone; ten had eclampsia and albuminuria; four, chronic nephritis; four, sepsis, and five, various complications. He questions whether the changes observed were due to pregnancy or to the other pathological conditions present. He concludes, after careful consideration, that pregnancy alone causes a hyperplasia of the cortical substance of the suprarenal capsules apart from any pathological condition, but that there is no evidence of changes in the medullary substance. In pregnancy complicated with nephritis and eclampsia there are changes also causing suprarenal adenomatosis; in infections, especially when prolonged and severe inflammatory conditions have been present, there is a small-celled infiltration of the fasciculated zone of the medullary substance, even resulting in connective tissue proliferation. In normal cases there are vacuolization of the elements of the cortical zone and pigmentation of the reticulated zone.

Experimental Trypanosomiasis in Pregnancy.—E. Ferroni (*Ann. di ostet. e gin.*, May, 1910) comments on the statements made that the blood of fetuses from mothers infected with trypanosomes do not show the disease, and that they are not found in the amniotic liquid or the milk. He produced experimental trypanosomiasis in rabbits and white rats during pregnancy, and examined them after they had given birth to their offspring. In most cases no influence of the trypanosomes on the result of gestation was noted. The fetuses born of infected

mothers showed no trypanosomes immediately after birth or later. There were no trypanosomes in the amniotic fluid. In the adnexia of the mothers trypanosomes were present, but they were absent in the fetuses. The utero-placental structure remained normal. There were no trypanosomes in the milk of the infected animals. Fetuses of healthy mothers did not become infected when they were nursed by infected mothers; but if they were inoculated with trypanosomes they contracted the disease.

Treatment of Eclampsia during Labor with Large Bleedings and Rapid Labor.—Al. Boissard (*Bull. de la Soc. d'obstetrique de Paris*, May, 1910) states that the proper treatment for a case of eclampsia coming on during labor is a large venesection, followed by a labor that is made as rapid as possible by the use of the Bossi dilator. When the fetus is not viable, and labor has not begun, it may not be advisable to hasten labor; and when the attacks lessen or disappear under venesection, and the child is viable and labor not begun, it is not necessary. Here chloroform may be given instead. The most encouraging results have been obtained by venesection in grave and serious cases. The author gives an illustrative case of an eclamptic who had remained forty-eight hours in coma, and in whom after two venesections, with the removal of 900 c.c. of blood, the use of a Bossi dilator completed labor in thirty minutes, with a living child and recovery of the mother.

Uterus Didelphys.—Lequeux (*Bull. de la Soc. d'obst. de Paris*, May, 1910) reports a case of uterus didelphys with pregnancy in one side of the uterus. The etiology of this condition, the cause of the failure of the two canals to unite, has been variously stated. It has been ascribed to the existence of a vesico-rectal ligament, a failure of involution of the bodies of Wolff, and a particular action of the round ligaments. The influence of heredity is admitted. Both uteri may menstruate, or there may be amenorrhea in both. It is considered sufficient in these cases to establish menstruation by a plastic operation or a hemihysterotomy. If sterility is present dilatation of the cervix may permit pregnancy. Some of these patients have an exaggerated fecundity. Abortion or premature labor seems to be frequent in the published cases. The failure of evolution results in a thinning of the uterine tissue. A longitudinal presentation often occurs. The gravid uterus may be revolved on its axis by the round ligament, which is single. More important is an inclination of the uterus to one side. During pregnancy the empty uterus increases in volume and softens; the cord that unites the two uteri may be so softened as to increase the independence of the two uteri. The diagnosis is difficult. The existence of a single round ligament or of a double vagina aids in making it. Contractions appear in the empty as well as the pregnant uterus, dilatation is slow, and engagement and presentation may be faulty.

Epidemic of Puerperal Fever having as its Cause a Normal Carrier of Streptococci.—Fabre and Bourret (*Bull. de la Soc. d'obst. de Paris*, May, 1910) describe an epidemic of puerperal fever which occurred after the finding of a case in which the lochia was found to contain virulent streptococci, although the patient showed no sign of illness. Her temperature rose only to 38.8° C. on the evening before the germs were found in the lochia. From that day there was an increase of fever among the patients in the hospital. In three weeks there were sixteen cases of fever, nine of which showed streptococci in the lochia. One case showed streptococci in the blood as well, and the infection terminated in death on the eighth day. The author accounts for the difference in the severity of the symptoms by the fact that most of the patients were infected several days after labor, while the one who died was infected on the day of her confinement, after the repair of a rupture of the perineum.

Diagnosis and Role of Gravidic Decalcification.—Marquiz (*L'obstét.*, June, 1910) says that osteomalacia is an exceptional affection. There occurs in every pregnant woman a primary degree of decalcification which is normal. Painful relaxation of the articulations is abnormal. A later phase is the cachectic one. Decalcification is accompanied by increased elimination of calcium in the urine, and castration lessens this, coincident with which the pains diminish, and the general condition improves. The theories of the production of osteomalacia are, first, a disappearance of the power of recalcification and a consumption of calcium from the bones which is increased by pregnancy; second, that the trouble is not so much one of assimilation as one of perversion of the disassimilation, the calcium being normally excreted from the bones, with hyperelimination in the urine and feces and decalcification. Decalcification has as a determining cause ovarian, suprarenal, or other disturbance, the predisposing causes being too frequent pregnancies, and poverty of food.

Adrenalin and Osteomalacia.—Kownatski (*Münch. med. Woch.*, July 19, 1910) says that it was thought at one time that castration would put an end to cases of osteomalacia; later it failed in a number of cases. Osteomalacia is a disease of failure of metabolism. The ovary bears a relation to this condition in that it has an effect on the metabolic processes. This secretion has an antagonistic effect to certain other secretions, such as that of the suprarenal bodies. Treatment by the secretions of these glands may be given in two ways; either by the use of the serum or milk of castrated animals which contains antibodies. or by administration of the secretion of the antagonistic glands. The author gives the history of a young married woman who became so badly affected by osteomalacia that she was unable to leave her bed, or to move about in it without great pain. She was given a solution of adrenalin hydrochloride and recovered entirely without deformity, and bore a normal child at term.

Abstraction of Calcium Salts from Mother's Blood by Fetus a Cause of Large White Kidney in the Former.—J. G. Drennan (*Med. Rec.*, July 2, 1910) states that, normally, cells undergo some fatty degeneration. Normally, calcium salts unite with this fat to form lipoids in which form it is conveyed from the organs to other situations, and after the abstraction of its salts is deposited there as neutral fat. In pregnancy there is an increased production of fat due to the increased work on the part of the renal epithelium. In pregnancy there may be a decreased amount of calcium in the mother's blood due to its abstraction by the fetus. Therefore, the fat in the renal epithelium is not combined with calcium to form lipoids and consequently remains there as neutral fat, causing an interference with the function of the cells.

Cesarean Section.—Cyrille Jeannin (*Presse méd.*, July 30, 1910) questions whether the introduction of the transperitoneal and extraperitoneal Cesarean section will enable us to extend its use in septic cases. He describes the methods of performing the two operations and their indications. He concludes that the use of these new methods will not permit us to extend the indications for the operation to cases that are either suspected of sepsis or are frankly septic. In suspected cases the classical operation with exteriorization of the uterus and drainage of the abdomen is not inferior to the extraperitoneal operation. In frankly septic cases these methods are equally dangerous. We should resort not to conservative but to mutilating section if we are not willing to attempt delivery by the vagina. Sellheim provided for this in his method of marsupialization of the uterus.

Danger of Rupture of the Uterus after the Cervical Cesarean Section.—J. Olow (*Zent. f. Gyn.*, July 30, 1910) has made a search of the cases of this nature heretofore reported, and questions whether there is danger of rupture of the uterus after the cervical Cesarean section. He finds records of thirty cases of this operation, in none of which rupture occurred at the next confinement. The author gives references to each of these cases. He concludes that there is little danger of the occurrence of such a disaster.

Aerothermotherapy of Gangrenous Wounds following Labor.—Robert Dufout (*Ann. de gyn. et d'obst.*, July, 1910) has made use of hot sterilized air in place of the cautery in the treatment of gangrenous wounds following labor, with success. The air penetrated the uterine cavity thoroughly and reaches where the cautery would not. In infected cervical wounds, especially where pressure has been extreme on account of slow labor, it increases the rapidity of cicatrization and sterilizes the wound surface. In these cases the anaerobic bacteria which are saprophytic in the vagina, find the tissue which has lost its vitality an easy prey to their action, and diphtheroid patches appear on them. Hot air stimulates the wounded tissues to throw off the infection. Its action is essentially reparative, not destructive,

causing intense hyperemia and vascularization. The author give records of two cases treated successfully by this method.

Gangrenous Perforation of the Uterus after Abortion.—G. Freux (*Ann. de gyn., et d'obst.*, July, 1910) concludes that there are cases of gangrenous perforation of the uterus after abortion that are not the result of attempts at criminal abortion by the use of instruments. To support his contention he gives the history of a case seen by himself in which the patient induced an abortion on herself by the use of a short syringe nozzle introduced into the cervix, through which dirty water was injected into the uterus. The result was speedy death from retained membranes and decidua material, accompanied by gangrenous perforation. Examination of the uterus *postmortem* showed that the perforation was on the anterior wall in a location which could not have been reached by the syringe nozzle. Cases described by other authors have also shown the perforation on the anterior wall. The author considers that the perforation was due to placental putrefaction, with formation of a slough in the same location where the uterine wall is thinned by the growth of the villi interlacing with those of the placenta. From a medico-legal standpoint, it is not wise to express an opinion of criminality in cases of perforation after abortion. Perforations have been found in women in whom there was no question of the use of instruments to induce abortion. In these cases two things co-exist, infection and partial retention of the placenta, which putrefies and propagates infection to the uterine wall.

GYNECOLOGY AND ABDOMINAL SURGERY.

Ovarian Grafting.—M. Scheurer (*La gyn.*, May, 1910) gives a very careful history of the process of ovarian grafting in animals and in the human being, as it has been pursued since the first grafts were made by Knauer, in 1896, in consultation with Chrobak. It has been proven that in animals the ovary may be successfully grafted from an individual to herself, and to another of the same species. Grafting has also been successfully done in women, both autografts and heterografts taking, and in different locations. The American authors have in general grafted onto some location near the broad ligament, while foreign writers have also grafted into the skin of the abdomen. In such cases the ovary has undergone periodic swelling and been a source of so much pain that the women has asked to have it removed. In a few cases menstruation has returned after the grafting, but in the majority of cases it has remained absent. It is uncertain whether the ovary retains its function after the graft has taken. Few patients have obtained from the grafting any marked benefit. This subcutaneous graft has the advantage that it is very easy of insertion and of removal in case of disagreeable results. The author gives a personal study of a case observed by him in which the grafted ovary, after removal, was examined microscopically.

The patient was operated on for fibromata, the uterus and adnexa of the right side being removed and the healthy left ovary grafted into the skin. A month after the operation the ovary swelled and became painful, and continued so at intervals until the graft was removed. Examination showed that the germinative epithelium had degenerated; the stroma was normal; three-quarters of the ovary was occupied by corpora lutea, some very large, others contracted. Many follicles were found, but either young or atrophied, and none in a state of maturity. It is probable that this ovary was not truly degenerated but approached the latent period. The author records twenty-two hitherto unpublished cases of grafting. The principal troubles for which grafting has been done are salpingitis and fibroma. Out of the twenty-two cases of the author, only four menstruated after operation. In seven, congestion of the ovaries appeared. In five there was no congestion, but symptoms of ovarian insufficiency. It seems hardly worth while to continue ovarian grafting.

Menstruation in India.—From a study of some five to six hundred cases at the General Hospital, Calcutta, J. C. H. Leicester (*Jour. Obst. Gyn. Brit. Emp.*, May, 1910) concludes that the onset of menstruation occurs later in the case of Europeans in India than in races of mixed extraction, and the more the dark element predominates the earlier is the age of onset. The onset appears to be slightly earlier among Europeans born and bred in India than in those coming to the country at a later age. The average periodicity of the flow would appear to be more regular in Europeans than in those races of mixed extraction. The average duration of the period is probably practically the same in all these races with the possible exception that it is of slightly shorter duration in Europeans coming to India than in those of other classes. The effect of the Indian climate on the periods of Europeans coming out to the country for the first time after the establishment of menstruation is nil in nearly two-thirds of the cases, and in less than one-third is there any increase in the amount lost. The effect of climate, both as to the onset of menstruation and also as to the amount lost at the periods, has probably been overestimated. Race would seem to have far greater influence on onset than climate.

Operation for Prolapse of the Uterus.—To the long list of structures which have been employed to support the uterus, M. L. Harris (*Jour. Amer. Med. Assn.*, 1910, liv, 1605) adds the tendon of the *psoas parvus* which he has utilized in two cases. Through a median longitudinal or a Pfannenstiell incision, with the patient in the Trendelenburg position, an incision is made through the peritoneum along the course of the tendon of the *psoas parvus*. The tendon is followed downward and divided at its point of insertion into the pectineal eminence. The finger is inserted through the incision in the peritoneum and passing subperitoneally raises the external iliac artery and vein from the

inner border of the psoas magnus and from the brim of the pelvis so that the finger passes along the lateral wall of the pelvis beneath the external iliac vessels and the infundibulo-pelvic ligament until the end of the finger is felt just beneath the peritoneum anterior to the internal iliac vessels and anterior and external to the ureter. The peritoneum is perforated at this point and with a curved forceps the end of the tendon is drawn down into the pelvis. The ends of the two tendons are sutured to the posterior surface of the cervix well down. Should the psoas parvus be absent the operation may be modified by the use of a portion of the psoas magnus.

Evolution of the Remnant of the Cervix after Subtotal Hysterectomy.—M. Meriel (*Ann. de gyn. et g'obst.*, June, 1910) says that after subtotal hysterectomy the remnant of the cervix is apt to give trouble in two ways; it may give rise to a profuse and disagreeable leukorrhea, or it may undergo malignant degeneration. On this account it seems better in many cases to do the total operation. Palliative treatment of leukorrhea is not of much value until atrophy of the mucous glands has taken place. The discharge is not an infected one, it is not malodorous and does not soil the linen as the gonorrheal discharge does. The cervix is not red, swollen, or painful. The discharge is quite fluid, and is a result of the modification of the cervical glands, which hypersecrete as a result of the traumatism of the operation. This condition comes mainly from a fault of technic, in leaving too much cervical tissue. The author removes all that he possibly can of the cervix, and finds that the discharge is not annoying. The cervix may be involved in cancerous or sarcomatous degeneration of the organ, and after the operation it may continue the original process and necessitate a second operation.

Abdominal Drainage in Gynecology.—Henri Hartmann and Marcel Metzger (*Ann. de gyn. et d'obst.*, June, 1910) discuss the results of drainage of the pelvis after abdominal operations. Their opinions are based on the study of 997 cases operated on. The peritoneum has a great power of absorption, and can remove a larger amount of fluid after operation. The cases include 268 fibromata, from the mortality statistics of which they conclude that drainage was used not too frequently, but not often enough. Of sixteen drained by the vagina all recovered; of fifty-five drained by the abdomen three died. Of the operations 446 were for annexitis, with twelve deaths. These results would indicate the advisability using drainage more often in these cases. A simple rubber tube with large openings is the best drain for the abdomen. Absence of drainage is generally followed by a slight transitory elevation of temperature. As to the occurrence of hernia, the difference between the drained and undrained cases is so slight as to be nil. The important point is to drain only a limited cavity whether it be infected or not. Drainage is contraindicated in extensive peritoneal

lesions. Although drainage is less used than formerly, it is a useful resource in properly selected cases.

Frequency and Dangers of Uterine Fibroids.—Reviewing a series of 971 autopsies performed upon adult females in the Boston City Hospital, E. B. Young and J. T. Williams (*Bost. Med. Surg. Jour.*, 1910, clxii, 663) find that fibroids of the uterus occur in from 7 per cent. to 16 per cent. of all adult females, and in from 7 per cent. to 22 per cent. of all over thirty-five years of age. The age at which fibroids giving rise to symptoms which demand their removal are most commonly encountered is shown by American statistics to lie between thirty-five and forty-five, and by German figures between forty and fifty. In fibroids of considerable or large size complications and degenerations dangerous to life occur in at least 10.5 per cent., and for this reason alone the routine removal of all such tumors is indicated. In submucous tumors and fibroid polyps necrosis occurs in over 43 per cent., and the excision of all such growths is, therefore, indicated. Small and symptomless fibroids are absolutely innocuous and of such frequent occurrence that they may safely be let alone. Such tumors, however, when met with in the course of operations for other conditions should be removed when feasible, because there is always the possibility that they may increase in size.

After-results of Abdominal Operations.—In a very detailed analytical study of 1000 consecutive abdominal operations, A. E. Giles (*Jour. Obst. Gyn. Brit. Emp.*, March, April, May, June, July, 1910) found that the general health was better than before the operation in 90 per cent. of the patients, 72 per cent. being in quite good health. About 6 per cent. were either worse or at least no better, in many cases from causes quite independent of the operation; and a further 4 per cent. had been much better for a time, and had suffered lately from ill-health due to local or general causes. The period of invalidism after abdominal operations was limited to about three months in 60 per cent. of the cases; of the remaining 40 per cent., about 25 per cent. (10 per cent. of the whole) ceased to be invalids by the end of the first year, while 75 per cent. (30 per cent. of the whole) remained either invalids or semi-invalids. The age of the patient had a marked influence; the younger the patient, other things being equal, the quicker the convalescence. The severity of the operation does not appear to have any direct relation to the rapidity of convalescence. The memory appeared to be affected in about 25 per cent. of cases after abdominal operations; further, the deterioration of memory appeared to be directly proportioned to the duration of the operation, as in cases of long operations for uterine carcinoma, the memory was affected in 50 per cent. of the cases; in short operations for hysteropexy the proportion dropped to 18 per cent.; and operations of intermediate duration showed proportionate percentages. Sixty-four cases out of 770, or 8.3 per cent., required further abdominal

operations. About 3 per cent. were necessitated by direct sequelæ of the operation, and of these the cases of inflammatory disease of the appendages supplied the largest proportion; six cases were necessitated by recurrence of uterine displacement; and thirty-four, or 4.4 per cent., were required for conditions independent of the first operation. The risk of subsequent independent conditions requiring operation is greatest after unilateral salpingo-oophorectomies, where it amounted to 9.5 per cent. The chances of pregnancy following unilateral salpingo-oophorectomy and conservative operations on the uterus are good; as 33 per cent. of married women under forty among these cases became pregnant afterward. Seventy-three per cent. of the completed pregnancies went to the full term; there were eight cases of extrauterine pregnancy, and seven patients were pregnant when they were last seen. Of sixty labors, fifty-five were normal, and five had complications that had no reference to the operation; the chances of labor being normal after these operations are, therefore, just as good as is the case with patients who have had no such operations. Eighty-eight per cent. of the patients had no trouble at all afterward with the scar; 7.7 per cent. had stitch abscesses, and 3.6 per cent. developed a hernia of the scar. The tendency to both complications is markedly greater after operations for inflammatory disease of the appendages; 90 to 93 per cent. of the "clean" cases had no subsequent trouble. The tendency to stitch abscess is diminished by modern improved methods, and particularly by the use of sterilized rubber gloves during operations.

Experiments with Intravenous Narcosis.—Hans Schlimpert (*Zent. f. Gyn.*, June 18, 1910) has made experiments on the newly proposed injection of ether subcutaneously with normal salt solution. He attempted its use first in animals, and finding that they bore it very well he used it also in human beings. The ether is used in a 5 per cent. solution, with a comparatively large amount of salt solution. He has not found this method of narcosis as valuable as had been expected, but it may be used in combination with scopolamin-morphine, in cases in which ordinary narcosis is contraindicated. Its principal application will be in operations on the head and throat, in patients with heart or lung troubles, and in patients who have shown an idiosyncrasy against ordinary narcosis. It may be employed in cases where lumbar anesthesia is not advisable. The method was used in six patients, five of whom had laparotomy performed. The author thinks that the method is not generally applicable to abdominal operations. In only one case was the narcosis satisfactory. In three cases there was severe intraparenchymatous bleeding. Profuse sweating occurred. The blood at the end of the cannula is liable to become clotted to that there is danger of embolism. The temperature of the solution must be kept at 28° C. to prevent this, which is not easily done. A large amount of fluid entering the circulation makes the patient liable to bleeding, by thinning of blood.

Evaporation of the ether renders it difficult to keep the solution sufficiently concentrated.

Hemorrhages into the Nonpregnant Tubes.—Louis Bazy, (*Rev. de gyn.*, July 1, 1910) finds that the notion that hemorrhages into the tube will occur only during pregnancy is an error, and that histological examination of such tubes shows that the conditions under which the hemorrhage occurred is not always allied with pregnancy. It may follow a tubercular salpingitis, or a tuberculous peritonitis. It may also exist in conjunction with circulatory troubles. The author gives histories of several observations of his own in which the specimens were examined. He finds that the epithelial layer of the tube is not much affected, and that it is the mesodermic elements of the tube that undergo changes, the connective-tissue layers. The vessels and muscular structures are changed. The primary lesions are of connective tissue, the secondary ones of epithelium. The author calls this a condition of pachysalpingitis hemorrhagica, comparable to the pachymeningitis of the brain. The epithelium is compressed and destroyed by formation of new connective tissue, and through the breach thus created hemorrhage occurs. The chorion of the mucosa is not the only part to undergo reaction. It affects generally all the tissues of the tube. The hemorrhages become organized, and unite with the new-formed granulations. There are also interstitial hemorrhages in the tissues themselves. These alterations are entirely independent of the pregnant state in the tube itself, although it may be affected by pregnancy in the opposite tube. It simulates a simple salpingitis, or a ruptured tubal pregnancy.

Roentgen Rays in the Treatment of Uterine Hemorrhage and Myomata.—Kronig and Gauss (*Münch. med. Woch.*, July 19, 1910) find that the use of the X-rays has a marked influence on the bleeding of myomata uteri and at the same time reduces them in size. Out of 568 cases of myoma uteri seen at the Freiberg Hospital, 505 were operated on, and sixty-three treated with X-rays. Removal of the entire uterus was done in 475 cases, and in twenty-two the fibroid was enucleated. In comparing the use of the rays with operation we must consider the mortality and the length of treatment required. The mortality of operations for fibroids is 3 to 5 per cent. The authors have made use of the rays only when there was heart weakness or extreme anemia which would contraindicate operation. In general, the first menstruation after the use of the rays is more profuse than usual, hence we must not make use of this treatment in much exsanguinated patients. The average duration of the sojourn of patients in hospital after operation was seventeen days, while a complete cure by the rays usually requires several months. Meanwhile the patient is able to attend to her household affairs as well as or better than before. It is necessary at times to leave intervals of two weeks or so between applications of the rays, in order to prevent

skin burning or erythema. For these reasons the authors operate on the majority of their myoma cases, since the treatment results more quickly and with less expense in a definite cure. Since the ovaries have been left in place the bad effects of complete castration have not been noted, and the menopause neuroses have been less evident. The effect of the rays is to diminish ovarian secretion, and the menopause comes on, but less rapidly than when both ovaries are removed. Chronic constipation is improved and necrosis and suppuration of the myomata have not been observed. Whenever operation would endanger the life of the patient on account of extreme hemorrhage, heart weakness, great obesity, bronchial catarrh, or other symptom, the X-rays should be used instead. The mortality under their use is 4 to 6 per cent.

Early Rising after Laparotomy.—E. A. Bjorkenheim (*Gyn. Rund.*, Fourth year, Part 14, 1910) gives the results of early sitting up and rising after laparotomy. During a year at the hospital at Helsingfors, Finland, 157 laparotomies were performed, out of which 131 cases sat up early. The result of this treatment is an early restoration to the usual health and strength of the patient, normal action of the bowels and bladder, with its lessened danger of cystitis and ileus, freer respiration, fewer cases of pneumonia and bronchitis, and the prevention of formation of thrombi in the pelvic and leg veins. If the patient is allowed to sit up on the second day to empty her bowels she will not require injections and drugs to move them, nor will it be necessary to catheterize the bladder. It will obviate the formation of gas in the intestines that is so unpleasant a symptom of the days after the operation. It is especially necessary to allow fat, weak patients to sit up soon, that the respiration may be better maintained and the danger of pneumonia be lessened. It also gives the patient a feeling of strength and well being that is in contrast with the weak, listless patients that we used to see after three or four weeks in bed. If the laparotomy wound is carefully sutured, there is no contraindication to early sitting up. The day for the first sitting up is not rigidly prescribed. It is left to the feelings and the condition of the patient to decide it. She is allowed to move about and to turn on her side on the first day. She is told that when she wishes she may sit up. A double elastic band is placed about the abdomen and she sits up for fifteen to twenty minutes the first time with a pillow behind her back. From this time she is not catheterized but told that she must pass her urine herself. She is given regular diet if she has no vomiting. On the third or fourth day she sits in a chair for twenty minutes, on the following day for one to two hours. A week after the operation she is allowed to walk about the room. Contraindications are fever, pus formation in the wound, and disturbances of the pelvic circulation.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

THE EXCEPTIONAL CHILD; THE INFLUENCE OF ENVIRONMENT AND EDUCATION UPON HIS DEVELOPMENT.*

BY

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AMONG the questions of great import for the progress of the human race, one of the foremost considers the future of the atypical, so-called nervous child.

The atypical child represents a class by himself, though in his variations he presents widely divergent characteristics. He is not the defective child as we understand the term, nor can we consider him abnormal. He does not show recognized mental enfeeblement and could not be classified with such types as the dullard or imbecile. The latter class, comprising as it does a vast host of humanity, much of it almost totally lost, but with which our educators have to deal and which in the last few years is being provided for by special education, is of vastly less importance in so far as their contribution to human progress is concerned than the class which I am here bringing to your attention. Whatever opinion one holds as to the worthiness of the defective class to special education, we must all admit that the nervous child, atypical though he be, is often endowed with superior qualities of mind and is well worth our best efforts to develop the dormant qualities within him.

The early recognition of these children is of paramount importance. Their deviations from the normal may be already recognized in the kindergarten years. With proper training,

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education and environment there can be developed in very many of them qualities of intellectual superiority. Indeed, some of our best minds—those that have contributed to the world's work along artistic and even more constructive lines—have shown early mental deviation. Among these children we find many of the so-called "misunderstood." As educators it is of the highest importance to learn their individual peculiarities; that we ourselves endeavor to understand them. These children are often highly imaginative; sometimes their imagination being in no sense constructive. In others, however, we see the imaginative form that leads to true constructive work; they are frequently, in a general sense, neurotic; are given to day dreaming; are sometimes the victim of that form of castle building known as the "continuous story." This is a form of fanciful imagination in which the individual lives in a representative life, the events going on from day to day, and in his leisure moments he takes up the thread of the fanciful existence. This form of day dreaming is not infrequent in neurotic children and leads to perverted methods of thought and lack of concentrative power in the ordinary things of life. The nervous child is likely to lack power of concentration. He is highly emotional; hypersensitive; is often not well poised. Though lacking in certain elementary faculties of understanding and simple judgment, the same child may show at times remarkable powers of argumentation, with flights of understanding and original thought. Characteristic in these cases is the variability of the mood and mental content. The exceptional child is not likely to be a good comrade, social and easy with his playmates. He often does not fit well with children of his own years. This frequently makes his younger years difficult and tends to intensify a high degree of emotional sensitivity. Many of these children cling with an abnormal affection to the mother. The feeling is not pure unselfish love, but in its very intensity is tinged with an indefinite fear of other associates. There are certain physical features, too, that distinguish some of these children. They are often of delicate mold; there is a certain indefinable sadness upon them. Their lack of concentration as well as the uncertainty and instability of will can often be observed in their actions and in their delayed response and understanding. The two latter defects are really only part of the same psychological deflection that is at the bottom of the general condition. There is usually a perceptible degree

of anemia, of rapid exhaustion usually manifested by relaxation of the muscles about the eye, giving the appearance of dark circles. There is likely to be some evidence of want of strong character in the anatomical outlines. The features of a rapid brain exhaustion as seen upon slight efforts at concentration are observed daily by every teacher. This is due in some instances to a true anemia of the cerebral centers and in others to the fact that many atypical children really do not think properly, do not know how to reach conclusions; perception and particularly aperception are affected. The teacher and parent must appreciate that the child may be mentally astigmatic, so to speak, and as a consequence has not the manner of mentally "getting at" things. In many cases certain centers within the brain are abnormally developed while others are retarded; again, the retardation or defect may be in the development of the association centers of the brain. Thus the child gets his percepts and particularly his concepts at an improper angle and the normal, clear, psychological attitude is upset. The importance of an understanding of this is manifest. These children often really work harder, spend unnecessary energy in small mental tasks, and thus become easily depleted. If this condition is permitted to continue, a foundation is laid for more serious mental disturbance and, in some cases, has really been the basis for final mental dethronement. I have observed among this class of children special endowments in the arts, in music, and in histrionic ability, though a manifest lack of efficiency in small, practical things. Perhaps the "idio-savants" are in this class. I have in mind a case of a young woman who holds an important chair in a well-known university, yet who is absolutely and entirely lacking in ability to do the simplest sums; further than that, her conception of mathematics and numbers is entirely lacking. Her deficiency in this respect approaches, psychologically speaking, a state of idiocy. To attempt to have made a mathematician of her would have been a waste of effort and have marred her life and destroyed her usefulness. It seems as though the unusual talents of some children at times approaching genius are developed both psychologically and with reference to the cerebral representation at the expense of other simple processes of brain action. The importance of an appreciation of this is of vast import in relation to the pedagogic, social, and environmental conditions of the atypical child. Because of the biological

variations in the development of the higher cerebral centers, causing divergent variations in the development of these children, we have the very widest range of defects and must consider the individual as such. Thus the teacher will be more guarded in judging which are the so-called bright children in contradistinction to those that appear dull ones. Again, do not forget that the development of certain brain centers or associative tracts of nerve fibers connecting these centers may be retarded; that in some children, in later years, may come the psychological development. In these cases proper teaching is important. It often requires the expert to recognize these cases.

We are indebted to Dr. M. P. E. Groszmann, Educational Director of the National Association for the Study of Atypical Children, for excellent observations and study of various types of atypical children. Dr. Groszmann emphasizes the importance of differentiation between the child with arrested cerebral growth and the one with retarded cerebral development.

My clinical observation confirms the importance of this differentiation. Retardation of the development of mental power may be due either to a general anemia, that is faulty nutrition of the entire body structure, or, again, to a retarded biological growth of the brain. In the case of arrest of development the limit of developmental possibilities is reached and comparatively little can be accomplished. These children of arrested development often show recognized brain lesions; perhaps some form of paralysis, some evidence of defective physical growth, some congenital anomaly of structure due to cranial injury or defect. As a result of this congenital or acquired lesion of the central nervous system, the higher cerebral centers have also suffered. The manner of education in the two classes is so different that early differentiation is most important. It is essential that the physician, the teacher and the parents understand the biological foundation for the difference between the child that is atypical in the sense that I have endeavored to describe, who needs mental training and development along special lines and the child whose cerebral development is retarded, and, again, the child whose mental development has reached its final stage. Thus, we really have three classes. Environment and education will do much for the first two; the third will often require strictly institutional care.

In considering the importance of environment and education

upon the human being, particularly in his earliest years, there looms large and ominous before us the specter of heredity. The relative importance of heredity and environment has been a source of contention among thoughtful minds for centuries. We have the extremists on the two sides of the question and, again, those who take the middle view. Far be it from me to minimize the influence of ancestral forces, the inherent impulses that are handed down from one to another; to absolutely deny the influence of heredity is to refuse to accept what has been proved to be a biological fact. The transmission of physical features is, of course, conceded, and I am one of those who is strongly inclined to accept the transmission of mental characteristics. On the other hand, I concede to education and environment powerful influence in directing and changing inherent tendencies. I am a believer in the reforming influence of the human will. Upon the question of the relative import of heredity and of education and environment rests the structure of our educational methods affecting particularly the atypical child. Bernard Shaw's statement—"The vilest abortionist is he who attempts to mold the character of a child," is open to challenge. I believe that human life can really be built up from without; that it is possible by means of proper environment and education to form the character and direct the life activity of the individual. I believe that the individual does not bring into the world, as in a mold, his character, his interests, his entire disposition, but that these, in the plastic years of developmental life, may be brought out, changed and directed, if we can but obtain the cooperation of the subject's will. I concede much to the raw material, but I maintain that character and intellect are fostered by home environment, by good schools and, where necessary, by well-equipped institutions. "Civilization is the sum of those contrivances which enable the human being to advance independently of heredity in the biological sense." And, as again has been somewhere said by another, "the progress which mankind is making is due to the lessons of life and not the mysterious potencies of primordial germs." Even Darwin, the greatest exponent of natural selection, concedes that the moral qualities are developed finally through reasoning power, religious feelings, etc., rather than through hereditary factors as determined by natural selection. Indeed, "the mental and moral faculties of man," as Wundt says, "know no law of conservation, becoming more

and more complicated and augmented without limitation. These are encouraging thoughts for educators.

I am so firmly a believer in the potential energy of hereditary forces that I would restrict indiscriminate union because of its influence upon progeny, and I firmly believe in the enactment of laws restricting the union of the unfit. I feel there is no stronger plank in the foundation of human happiness than that which would prevent sexual union of those who are mentally or physically manifestly abnormal. However, we are dealing with conditions as they are not as we wish them; until science and education shall have demonstrated fundamental laws of heredity we must combat ignorance by the forces of environment and education operating upon the offspring.

Defective and improper environment in early life, particularly when added to hereditary predisposition so often present in the case of exceptional children, is a primary cause of neurasthenia and nervous breakdown; in the case of impressionable, unstable children, it develops irregularities of character that disturb and retard the moral, intellectual and physical energies. In the plastic years of life the home and school teaching should be along lines that by example and theory develop firm will and clear thought, positive action without vacillation. The importance of surroundings upon the ethical side of the atypical, the unstable child is emphasized by a study of social life in its relation to juvenile delinquents. The inherent tendency to sexual perversion and general moral deflection that characterizes certain forms of highly neurotic children is common observation. There is in some, moral astigmatism rather than intellectual defect, and upon proper training and precept will their future depend. The moral pervert is the type of atypical child that often requires most skillful treatment. Intellectually endowed though he be, moral imbecile or moral anomaly as he often is, he represents in early years the man who in later life attains temporary honor, sooner or later startling the community as a fallen idol, the victim of inherent moral obliquity. Here again the watchful teacher and parent should recognize in early life the warning signs that demand the exercise of judgment and firmness; the bending twig must be straightened and set in the line of proper growth before it becomes a branch unyielding in its textural firmness.

The mental qualities of the atypical child must be carefully

analyzed; the variations may involve the intellectual capacity alone, or, again, the moral faculty may be defective or entirely absent. As a rule, I have observed that the strictly intellectual and the moral defects are coexistent. In these cases the strictest kind of discipline and moral force can alone redeem these young unfortunates. In a certain class of children, some only in a small degree below the average of intelligence and even in some ways precocious, there appears a want of natural development of the moral sense. These children lack affection, are especially rebellious to correction and show cruel tendencies. While it is true that the moral development of the child is largely a matter of education, these cases seem lacking in the inherent basic principles necessary for the normal development of the moral side of man. These children are really moral imbeciles. With them, wrong doing, sometimes committed with what seems diabolical viciousness, is analogous in its initiative to the impulses of the kleptomaniac and of the pyromaniac. In this class, though there be intellectual efficiency, the influence of environment and teaching is small. Other cases are not as extreme, the moral possibilities are present to a degree and, although this class of children presents great difficulties and requires special training, there is still possible the development of a marked degree of self-restraint, rigid care by expert teachers and a selected environment is required to make these children useful members of society.

A large percentage of juvenile delinquents show a high average of artistic ability. Doubtless in each case a proper psychological analysis would show the absence of some quality necessary for successful pursuit, and I am certain this defect could be largely influenced by training. The absence of physical defect in a large percentage of juvenile delinquents speaks for acquired rather than hereditary forces. The teacher of atypical children especially must be familiar with individual psychological defects and for this the normal mental processes must be understood. In the case of the atypical child, not the quantity of mental material forced upon it, but rather in the quality and method of thought imposed upon the child, will we find the success of effort. For the atypical child especially I disapprove of the so-called "central ethical" idea method, that is the grouping of all subjects for a period of time about a nucleus or idea. This Herbert-Zeller method is far inferior to that advocated by Dr. Groszmann. Through primitive

percepts and concepts the association and assimilation of these as interpreted through a perception by what the child has already learned, is the method by which it must add to its mental storehouse. The new percept and concept must mean a consciousness of more than that which the object itself gives; the child must be taught that new impressions be associated and seen in the light of similar ideas already present. As Groszmann says, it is evident that the logical relation of the details of the subject matter will enable us to make application of a general rule; in this way we may establish an instructional inter-relation of topics introducing new ones by establishing a perceptive association with those which existed before. In order to establish this effectually, teachers will be obliged to ascertain the mental status of children entrusted to their care, the extent and character of the concepts already forming their intellectual possessions and determining their emotional attitude. There are other factors to be observed, such as the reaction time, power of inhibition, fatigue limit, etc., of each individual child. Groszmann has thus a far wider and more truly psychological method than that of co-relation simply, as expressed by the Herbert school. It is just in cases of atypical children that we see the want of coordinate mental activity. I can even see the development of certain forms of mental derangement, in later juvenile life, in improper methods of thought and learning. Children must learn to relate details to common groups so as to enable them to establish a conceptual order in the wilderness and embarrassing multitude of details, and thus to recognize "old friends in the new setting." Unless this be done the child may have to learn anew about the same geometrical form in the workshop which had become familiar to him as an element of his mathematical study or he will not recognize in the construction of a stove an application of the same laws which he had studied in his physical laboratory as governing radiation and distribution of heat. I believe in a simple way these psychological laws can be applied already in the kindergarten. It is a question whether instead of teaching the nervous child with his basic psychological defects, small basket and weaving work, it would not be better to give him more mental and larger and more excursive exercise. I believe these fine movements, demanding fine adjustment of the eye muscles as well as the extremities, tend to develop spasmodic choreiform movements.

It is really only within recent years that the students of mind and pedagogy have begun to appreciate the influences of environment and education upon those delicate years of evolutionary life, the pubescent and adolescent periods. The teacher, parent, and the family medical adviser must know of the psychologic and physiologic changes which attend these periods. At these times of transition the deeply fixed forces of heredity, with the very important modification induced by environment and education, play their strongest rôles. These periods from about the tenth to the fourteenth year and then to about the twenty-second, are years when great changes are being wrought in the economy. As Dr. Meyer says: "Fatalistic has been the attitude of those who have accepted hereditary tendencies as excuses of the bad conduct of children, and they have been left uncared for by reason of a lack of faith in those who should exert themselves the most." "Among the twenty-five thousand persons who are (1903) in the public and private institutions of the United States alone, there are many brilliant hopes buried, owing largely to a lack of knowledge of what some need in the way of social and personal hygiene. Remember that some of the most illustrious members of the race have been previously near the borderland of insanity and seem to have been great, although they showed obvious traces of the same misled instincts that completely wrecked others. Are such people not worth our help? Should not the home, the press and the school heed some of the dangers and shape their methods and ethics accordingly?"

I maintain that in early life we have the plasticity of mind, the opportunities for molding, for redeeming these individuals.

At puberty and in early adolescence we observe the awakening of formerly quiescent forces and especially in the atypical child, rapid variations in the intellectual and emotional spheres. We see the development of religious, moral and ethical feelings, strong sexual impulses, the awakening of ambition and, in healthy children, a dawning of interest in human institutions and forms. These are the formative, the plastic years and the ones fraught with so much danger to the nervous child; his being may be made or marred. The variations of his psychic life are bizarre and may come ominously near the ragged edge in the struggle of the psychic forces for proper balance.

The premonitory signs of neurasthenia and psychasthenia appear in a child of nervous instability in the form of morbid

excitement such as irritability of temper, nervous laughing, palpitation and general inaptitude for work. There is want of fixation of attention and experience of languor and sadness; an unreasonable reaction, as shown in emotional tone, to reproof. If, as is often the case, the home environment is unsuitable, the psychic reaction becomes in a greater degree morbid and various obsessions, morbid indecision, perverse sexual feeling, take root, and, in later years, are responsible for the development of the mental breakdown so common when the stress of the conditions of life become too tense for the weakened condition.

In conclusion, I have only to emphasize the vital importance of physical hygiene especially upon neurotic children; the desirability of suburban life, regular hours, instructive games and outdoor sports that interest but do not excite the unstable mind. The body, like the mind of nervous children becomes more easily fatigued; neurotic children, like nervous adults, find a restful invigoration and a feeling of calm in the quiet of suburban life. It is important that the hygiene of the nervous child be such as to secure the highest physical nutrition for the economy; for this includes nourishment for the intricate centers of activity within the brain. Nervous children react especially to emotional stimulæ such as music, sensational drama and romantic literature, and all these should be guarded against. Children who have plenty of fresh air and an abundance of exercise and physical and mental freedom, become better poised and are less likely to succumb to inherent perverse moral and sexual instincts.

Many phases of the social question, the struggle of woman and her place in social, economic life, her position in the home, the great stress which the parent is obliged to undergo for existence in the large cities, these questions have a direct bearing upon the environment of the child. The general moral and intellectual atmosphere of the home has an important influence upon the nervous child, especially since those of the neurotic type are keenly sensitive to unhappy home conditions. Overpowering obsessions, morbid fears, sexual perversions frequently find origin in the atmosphere of a home with unhealthy moral, physical, and social hygiene. Self-control on the part of the parents, with an intelligent display of affection and judicious sympathy, together with high ethical ideals in daily life, are examples that stand out in relief in representative

education. Remember that the nervous child is already predisposed to such disorders as St. Vitus dance, speech defects, nervous twitchings, habit spasms, and these may find their origin in a sudden emotional disturbance caused by fright, fear, or any form of mental shock. We must endeavor to reduce to a minimum the inherent tendencies that tend to destroy the proper mental balance and endeavor in every way to bring the child's supply of nerve force to the highest plane of resistance. Develop his will and, when necessary, raise the child's estimate of himself.

Time and space limit me to a mere outline in a plea for special attention to the atypical child; remember he does not belong to the defectives.

34 WEST EIGHTY-SEVENTH STREET.

THE PREVENTION OF THE MORE COMMON ERRORS OF DEVELOPMENT.*

BY

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CERTAIN congenital deformities due to errors of development seem at present beyond control, such as club-foot, dislocation of hip-joint, or cleft palate. There are, however, many deformities appearing during infancy and childhood, which in many cases could be prevented, or, if noted early, under suitable treatment cured. We should constantly be on the outlook for any slight deviation from the normal in the growing child, and our management of the growing child should be such as to avoid its developing deformity.

The earliest problems in infancy are food and clothing. It is needless to say that the child's welfare demands nourishment from its mother's breasts. This is its right unless there is a very real contraindication. At my clinic, frequented largely by children, one can select certain bottle-fed children by their general condition and appearance. The bottle-fed baby or the one largely brought up on any of the proprietary foods, is a poor risk and quite liable to the development of some

*Read at the annual meeting of the City Hospital Alumni Association, May 11, 1910.

deformity. So we may say right here, regular feeding with the right food will prevent many of the so-called errors of development.

The first dressing of the baby is always interesting. The binder tightly applied and the different garments frequently restrain free and normal movements, just at the time when the child is attempting to inflate the chest and unfold itself from the long-continued pre-natal position.

Freedom as regards respiration and general movements during early infancy is an important factor in development and so a preventative of deformity, as for instance of the contracted chest.

In this city I have not infrequently been called in to see very young babies, with the binder extending well up over the rib line. Such pressure on these tender structures can only result in compression of the lower ribs, with probable pushing forward of upper sternum, or the production of some other deviation of chest wall.

The normal child begins life with deep breathing exercises, but the nurse is frequently equal to the occasion, and after the application of binder and clothing (compression), the pacifier is brought into use. We soon have a picture of the little one drawing in and sucking, evidently to its own satisfaction, as it is a very easily acquired habit. This sucking and drawing in tend to produce a vacuum in the mouth followed by changes in the palate, jaws and pharynx. Many a high arched palate and many a deformed jaw may be traced to the early use of the pacifier or empty bottle.

In speaking of the nursing child and his rights, I am constrained to say a wet-nurse should never be deprived of her baby. This would be most unfair to her child; yet only this winter a woman of some position wished to take a wet-nurse who was under my care on condition that she throw over her own baby. This offer was promptly refused. To jeopardize the health of a strong but poor baby for the benefit of a weak but rich baby did not appeal to me. This case reminds us that we need ethical culture as well as physical culture.

Given a child brought up on artificial food, dressed so as to be under physical restraint, kept quiet with the pacifier (artificial nipple) the opportunity for acquiring some error of development is very great. At the walking age we often discover rickets with its resulting deformities, later in life we discover

the high palatal arch, the protruding or receding teeth, the large tonsils, adenoid tissue, cervical glandular enlargement, and so on through many depraved states up to infantile atrophy.

Every child should receive a careful examination at the walking age, and after learning to stand, the physician should be always ready to prevent the onset of deformity about ankles and knees. A common tendency at first is toward flat-foot with a secondary knock-knee. This is met with frequently in rickety conditions, in very heavy babies, and in children standing too soon. Often there is rather marked bow-legs, due to deficient unfolding of the leg-bones. When discovered quite early, say before the walking age, treatment should be begun at once, and very light braces may be required as soon as the child stands. A large and clumsy diaper persisted in at the walking age, separating the thighs, has resulted in compensatory bow-legs.

Laced orthopedic shoes are often required and if there seems to be occasion to make any change in the footwear, it is advisable to consult an orthopedic surgeon, rather than the instrument-maker or the shoe-maker. Many a child has been helped through a happy guess, but if the orthopedic surgeon saw his patients earlier there would be less deformity, and he would be given an opportunity to practise preventive medicine.

The breathing of the child should be noticed—mouth breathing is always significant. The condition of the nose and mouth should also be noted. I believe that as the jaws develop and the teeth appear, it is always safer to have an expert examination by the dentist. Surely this multitude of cases requiring orthodonture, the protruding teeth, the receding jaw, the imperfect alignment should receive very early treatment, for this has an important bearing on the breathing, the development, and the intelligence of the child.

Large tonsils and adenoids with the usual chain of cervical glands require attention, and many of these patients require their removal. That is, the child must be made a nose-breather, and put in the way of obtaining a proper chest development. After removal of adenoids and tonsils, physical culture should always be employed, the child being taught proper breathing exercises.

Cases of spinal weakness with or without lateral curvature, stooping and round shoulders often accompany adenoids and enlarged tonsils, deficient chest development, or any marked

condition of weakness such as simple anemia. The condition of round shoulders always requires immediate attention as it is likely to result in lateral curvature, to say nothing of the chest deficiency. These patients frequently are guilty of some gross fault in diet. We find here the young tea drinker, or coffee inebriate, the eater of starchy foods in excess or sweets, the rapid eater, the pickle eater, the child with no appetite, and of course, often enough the constipated child.

Among the poorer classes, the treatment frequently consists in chronic scolding and fault-finding by the mother who wonders why the little girl is not growing up right. Threatening, of course, does no good, and the large numbers of weak, round-shouldered, anemic, semi-tubercular girls approaching a serious period of development require special handling and care.

Proper diet, avoidance of fatigue, physical culture, hygiene, tonic treatment, and all possible encouragement are necessary.

It is deplorable and pathetic to watch, as I have done, the undeveloped unhealthy girls go on to womanhood and motherhood, going through life in a depressed physical state, their children also suffering from mal-nutrition and adding to the suffering of the world.

In our observation of the growing child, we should note its walk and its posture; the type of breathing and the chest capacity, the breadth and symmetry of the shoulders, the condition of the spine, and at all times the growth and development of the osseous system. The dropping of one shoulder, the dropping of the head, stooping or round shoulders should be noted and corrected at once, for many of these conditions, if not corrected, are progressive. Defective standing and walking are extremely common. Every day we see young girls walking along with improper shoes, the inner edge of sole and heel worn down, and the inner aspect of ankle dropping—a condition of valgus. Here we have at fault both parents and physician. Physicians should be on the lookout for these conditions, as early correction or prevention are so important in promoting right standing and walking. This condition of mild valgus is often enough the forerunner of painful and deforming flat-foot.

The growth and regulation of the osseous system is under a nervous control, little understood at the present time, and is due to activity of the osteoblasts or bone builders on the

one hand, and the osteoclasts or bone destroyers on the other. During bone growth, the osteoblasts deposit new lamellæ, the osteoclasts destroying and removing old tissue.

This mechanism is certainly disturbed in rachitis. During development we may have excessive growth or destruction, retardation of elongation (interference at the epiphyseal line) or delayed union at the epiphyseal line with overgrowth, inflammation, infections, or new growths. One of the most common causes of acquired deformity of bone is the irregular structural formation in rachitis. Every child at six months should be examined for craniotabes, the most reliable early symptom of rickets, though constipation seems to be the fore-runner. It is surprising how often craniotabes, large fontanelles and the rosary are found when looked for. As soon as discovered correct the diet and give phosphorus, even though it is a self-limited disease. I have found that in well-marked cases it is not always easy to differentiate between a rachitic skull with the olympic brow and the hydrocephalic cranium. In severe rickets disturbances in the growth of superior maxilla may occur. We have seen in this region narrowing with a high palatine arch and protrusion of the teeth. The teeth in rickets are frequently poor and distorted.

Rib-changes occur such as lateral depression, alterations in thoracic contour as in the "chicken-breasted" individual. Kyphosis of spine has been noticed and may be followed by a true scoliosis. Bow-legs, knock-knee, flat-foot, bowing of fore arms, all occur with varying frequency.

The two periods of great bone growth demand attention. The first from the third to fifth year may be called the early or infantile period. The second from the fourteenth to sixteenth year is the period of adolescence. At both these periods there is a liability to deformity. As an example of acquired deformity in the second period may be mentioned the bending of the neck of the femur, said to be due to rickets of adolescence. At this period in girls we see many cases of deviation of the spine.

Weakened structures require support and protection as soon as discovered. Tonics alone will not do. During the active stage of any deforming disease protection must be carried out as in rickets and infantile paralysis. Fatigue and over-exertion must be avoided in the growing child.

A consideration of the errors of development involves a study of the anatomic age. By employing an anatomic standard

rather than a chronological one, school grades and child labor can be dealt with intelligently. This also has a practical bearing on development. For example, all babies are not ready to stand and walk at the first year.

The anatomic age should be determined at the different stages of development during the growing periods and this knowledge applied to the great questions of growth, education and child labor. Today it is very generally appreciated through the work of Crampton, Rotch, and others, that there is often very little relationship between the chronological and the anatomical age, as for example, the variability of the age of puberty, or in the examination of 1000 elementary school boys from ten to fifteen, the appearance of the teeth had little to do with the chronological age.

Dr. W. W. George, radiologist at Children's Hospital, Boston, found that the most practical and reliable index of development was represented by the hand and wrist studied by the Roentgen ray. The anatomic grouping is of great value in gymnastics and athletics, for by this method of classifying we can avoid many cases of overstrain.

A standard of development should be adopted for the protection of early child life and in the interest of athletic and educational reform. By this anatomic standard we will determine the proper walking age as well as proper age for entrance to kindergarten and school.

Rotch in his grading begins with group A, age of child six to twelve months. Roentgen ray shows only os magnum and unciform. As we go through the different groups more of the carpal bones show; later they are much more massed and show further development, until we reach group M, shown perhaps more often at fourteenth year, when all bones of wrist show, they are more developed and the pisiform is almost as large as the cuneiform. In this system of grading we do not think in years and months but in normal anatomic groups.

Crampton emphasizes that the influence of physiological age in education should be borne in mind by the family adviser. At certain ages it has been found that the mature are 30 per cent. heavier, 10 per cent. taller, 30 per cent. stronger than the immature. The usual plan of educating children does not differentiate between the mature and the immature.

The following suggestions are made for the prevention of many common deformities:

1. Educational. A more generally distributed knowledge of hygiene, physiology and anatomy is essential.
2. Expert examination of children at certain periods of development.
3. Clothing of infants and children should be rational.
4. More physical culture. All children should be taught deep breathing exercises—and especially after operations for adenoids and tonsils.
5. The extension of our social forces such as settlements with their gymnasiums.
6. Better supervision of our child laborers in all industrial enterprises.
7. Altruism in the home. The weak must be helped by the strong. Parents must be encouraged not to allow the weak to work long hours or at improper occupations. Growing girls with advancing scoliosis or with marked chest deficiency should not attempt dressmaking or teaching. The parent and the patient must be correctly advised or they will probably follow along the way of least resistance.
8. The very general adoption of the "anatomic age" that our children may be properly grouped and graded, and in this way their development guarded.

76 W. EIGHTY-SIXTH STREET.

THE TREATMENT OF NASAL CATARRH BASED UPON THE MODERN VIEW OF ITS PATHOLOGY.

BY

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THE term nasal catarrh has such a wide application and at times such a vague meaning that it can hardly be called a scientific term in the strictest sense. While this is true, it is, however, a very convenient term to indicate any and all forms of nasal disease regardless of the particular pathology or symptoms. In the present consideration of nasal catarrh, the two varieties known as atrophic rhinitis or ozena and the reflex nasal catarrhs or neuroses, will not be taken up. They present two very distinct pathological pictures with well-defined symptoms. With this brief reference to these two forms of nasal catarrh, we will pass on to the subject matter of this paper.

The text-books and various writers have classified the nasal catarrhs on a more or less definite pathological basis. It has seemed to me, as I see these cases in hospital and in private practice, that the clinical picture presented suggests a very practical classification. I have been accustomed to classify all cases of nasal catarrh, with the exceptions above mentioned, as follows: Those in which the pathological lesions are limited to the nasal cavities proper; those in which the pathological lesions are limited to one or more of the accessory sinuses, and those in which both the nasal cavities proper and sinuses are involved in the pathologic process. What is the pathology, symptoms, clinical picture and treatment of these forms of nasal catarrh?

Any departure from the normal anatomical and histological structure of the nasal chambers constitutes a pathological lesion within the nasal fossæ with resulting symptoms directly proportionate to the degree of departure from the normal standard. A brief reference to the normal histology, anatomy and physiology of the nose and accessory sinuses will serve to make more forcible the pathological picture to be described.

The mucous membrane lining the nasal fossæ and the accessory sinuses is abundantly supplied with arteries, veins, nerves and lymphatics. This abundant supply, together with the numerous mucous and serous glands and the cilia, all demonstrate how well nature has proved for the physiological functions assigned to the nasal cavities. The average total capacity of the nasal fossæ proper is approximately 42.6 c.c. or 1 1/2 drams or nearly 1 1/2 ounces; while that of the accessory sinuses is approximately 89.2 c.c. or 3 ounces, making a total capacity of 131.8 c.c. or nearly 4 1/2 ounces. This entire area has been provided by nature with important physiological functions and their preservation is dependent upon the maintenance of the normal anatomical relations and capacity and the normal histology of the parts. The detailed study of the arterial, venous, lymphatic, nervous and glandular supply of the nasal fossæ and accessory sinuses explains the important duties nature has imposed upon this comparatively small part of the human organism. The very close relations of many important structures and the intimate connections with them through the arterial, venous, nervous and lymphatic systems renders the preservation of the normal much more imperative than would be the case if this

connection did not exist. I need only mention the physiological functions of the nose and the accessory sinuses to emphasize their importance. They are olfactory, respiratory, gustatory and phonatory. Of these the respiratory function is of course the most important although the others should not be overlooked. In addition to these the nose affords protection against invasion by pathogenic bacteria and foreign particles.

The pathology of nasal catarrh limited to the nasal cavities proper varies from the slightest departure from the normal to the extreme picture of a complete structural change to the extent that there has resulted a total loss of all of the physiological functions. We are no longer able to recognize the normal. While such extreme cases are comparatively rare they do exist. The pathological changes within the nasal chambers proper have, with the exceptions to be mentioned, an anatomical basis as the original or initial lesion. The exceptions are those cases secondary to adenoid hypertrophy, to sinus disease, and to certain extraneous conditions, namely, age, sex, climatic fluctuations, exposure, faulty appa^ral, disturbances of the alimentary tract, anemia, diabetes, nephritis, tuberculosis, rheumatism, syphilis, and all conditions resulting from faulty metabolism. These conditions by lowering the resistance of the mucous membrane may act as causative factors in nasal catarrh. They may even in the total absence of nasal malformation act as etiological factors. We find, however, that they produce more or less nasal stenosis by the inflammatory conditions resulting therefrom. These conditions and others should be considered in the treatment even in the presence of marked nasal malformation and structural changes. We may have an acute infection in the nose or sinuses previously normal, but when we consider the physiology and histology of the nose we must be convinced that the invading bacteria must be very virulent and overwhelming in numbers to overcome the barriers that nature has provided. An example of this is frequently seen in influenza. This disease is responsible for the greater majority of infective catarrhs. That bacterial infection is a concomitant of nasal catarrh and is always present is, of course, accepted. With a departure from the normal anatomical relations and a consequent change in the normal histology resulting in perverted physiology functions we get a train of symptoms constituting nasal catarrh. We have a loss of the normal functions in all or in part and have substituted the

evil effects of the pathological conditions arising therefrom within the nose and accessory sinuses, in the adjacent organs and structures, and in the more remote parts of the body.

I will not go into the detail of the manner in which an apparently insignificant anatomical malformation may give rise to marked pathological changes. Given such an irritant which results in hyperemia of the adjacent parts we have, as a result, exudation, chronic thickening, collection of secretions, growth of pathogenic bacteria, suppuration of the mucous membrane of the nose and accessory sinuses, involvement of the adjacent organs and structures and systemic infection. That this pathological picture is very rare except in the presence of perverted functions within the nose is only too evident. All things being equal, the more marked the original lesion the more rapid the development of and the more severe the resulting changes and symptoms.

I need hardly mention the symptoms of nasal catarrh. The patient must always have symptoms even in the cases in which the departure from the normal histology and anatomy is very slight. That the symptoms may not attract the attention of the individual affected or warrant the institution of treatment does not mitigate against this fact. We have changes in the character and amount of the secretions. We have a varying amount of nasal stenosis. There may or may not be pain. The pain may range from a very slight transitory headache to pain of a most distressing and long continued character. Any part of the head may be the seat of this pain depending upon the seat of the lesion. A profuse purulent discharge always indicates sinus involvement. With a large amount of infectious material locked up due to faulty or an entire lack of proper drainage we are sure to get an absorption with the self-evident results. We may have a direct extension to the adjacent parts such as the eye, dura, and brain. The instances in which we have only one or more sinuses involved without any evident pathological changes in the nose itself are seen only in the acute cases. In all the chronic cases we have resulting changes in the nose proper due to the prolonged exposure of the parts to the infectious and irritating discharge. Much discussion has been indulged in as to which of the sinuses is most frequently the seat of disease. My personal clinical experience places the ethmoid cells of the anterior group in the first place. The reason for this is very plain when one studies

the anatomy of the nasal fossæ and sinuses. I fully appreciate that this view is not in conformity with that of most writers; the antrum being credited with most frequent involvement by most writers and text-books.

The symptoms of sinus disease vary with the extent of involvement and the particular sinus or sinuses affected. It is not within the scope of this paper to go into the detail of sinus, but a diagnosis should always be made. Those not possessing a particular knowledge of these conditions should always be able to make a diagnosis of some involvement, even though the particular parts involved and the extent to which they are involved may not be quite clear at the time. If a patient has nasal discharge or nasal stenosis it is only too apparent to the causal observer. If the patient has pain in the head, no matter what part of the head is affected, it may be due to nasal and sinus disease. It is true that pain in the head is not always due to this cause—very far from it—but in the absence of a specific cause other than nasal or sinus disease the latter should always be suspected and is entitled to investigation.

I fully appreciate that the foregoing remarks have been superficial and lacking in detail. A detailed paper on nasal catarrh has been intentionally avoided as being perhaps of little interest to those not particularly interested in this special line of medical work. If what has been said has demonstrated or at least indicated the necessity for the relief of nasal catarrh, its object has been accomplished.

Treatment.—The treatment is entirely based on the pathology. I have previously mentioned the need of proper attention being paid to the relief of any and all extraneous etiological factors. These should in every instance receive careful consideration and appropriate treatment. If one confines his attention to the relief of the intranasal and sinus pathological lesions and does not consider all of the concomitant etiological factors he will fall far short of giving his patient appropriate treatment and consequent adequate and permanent relief. The nose and throat man must not lose sight of the need for the cooperation and the application of the skill of the internist.

The early removal of adenoid hypertrophy is so plainly indicated that it needs no justification here. It should be done just as soon as there are resulting symptoms. By this I mean the earliest symptoms, as much harm is done by waiting

until the child is old enough to have it done or old enough not to need it, or outgrows it. These last remarks are of every-day occurrence and familiar to us all.

In the correction and relief of septal deformity the principle involved in the submucous resection operation should always be employed whenever feasible. Experience has taught us that this particular method is the method of choice. It does the least harm to the nasal structures, gives the best and the most permanent relief, leaves an insignificant wound, leaves the least scar tissue, requires the least amount of after-treatment and gives the least distress to the patient.

For the relief of hypertrophy of the turbinate bodies we have several measures at our disposal. In simply hypertrophy of the inferior turbinate and when the application of adrenalin chloride contracts the hypertrophy sufficiently to give adequate relief, the use of galvano-cautery is often quite appropriate. I have used the cautery comparatively little during the past two years. I have found it inadequate in cases in which I formerly used it as a method of choice. If the hypertrophy is large it requires considerable cautery work to reduce it and this leaves behind a large amount of scar tissue. A clean cut with a good cutting instrument does the work better, leaves less scar tissue, and is more permanent. Care should be exercised in not removing too much. It is easy to remove and beyond our power to replace.

In the cases in which we have actual bone enlargement of the inferior turbinate a cutting operation is the only one indicated. The relief of enlargement of the middle turbinate is always a cutting operation, the use of the cautery being here strictly contraindicated. The treatment of sinus disease is grouped into two classes. The conservative measures consist in washing out the sinuses through their normal openings and the introduction of astringent solutions. With the antrum of Highmore this may be done by making a puncture with a cannula beneath the inferior turbinate bone 1 inch posterior to the anterior end. This is $1\frac{1}{2}$ inch behind the opening of the lachrymal duct and is done without any injury to this canal. The antral process of the inferior turbinate bone here closes up the naso-antral wall and is very thin and very easily punctured. The cases which cannot be relieved or cured by the foregoing measures call for surgical procedures. In antral disease there are two operative procedures to be considered.

Numerous operations have been devised for the cure of antral disease, but we can limit ourselves to two procedures, one in which general anesthesia is used and one in which local anesthesia is used. The first consists briefly of cutting away the external wall of the antrum by way of the canine fossa, and when this has been properly done, removing all the pathologic findings within the antrum. The next step consists in cutting away enough of the naso-antral wall to give a good-sized opening. This part of the operation is important and the opening should be made with the object of allowing the external opening to close and maintaining a permanent opening into the nasal cavity. The anterior end of the inferior turbinate is sacrificed in the procedure.

The second operative procedure may be very readily done in the office under local anesthesia. The anterior end of the inferior turbinate is cut away and with appropriate cutting instruments a good-sized opening is made through the naso-antral wall. This is done, of course, from within the nose and the opening should be sufficiently large to be permanent. The use of flexible curets will facilitate the removal of pathologic material from the antral cavity.

The acute cases of ethmoid disease—empyema of the ethmoidal cells—involve either the anterior group of cells or the posterior group or both. Most acute cases will respond to such conservative measures as douching and astringent applications. Where there is much blocking in the middle turbinate region this will not always be the case. The acute symptoms will be relieved, but there may remain a condition of closed empyema of one or more of the cells. The removal of a part or the whole of an enlarged middle turbinate may be necessary in order to secure relief. We may have to puncture one or more of the cells to facilitate drainage. Often an opening made in the anterior ethmoid cell, the bulla ethmoidalis, will be all that is required. In the chronic cases in which we have diseased bone or the formation of polypoid growths the only proper way to secure a cure is to cut away the ethmoid cells in their entirety. That this is absolutely necessary in many instances in which it is not done I am fully convinced. This may be done in the office under local anesthesia with comparatively little discomfort to the patient. Illustrating this class of cases, the following is quite typical. After removing the middle turbinate bone I cut away all of the ethmoid cells on one side.

This was done under local anesthesia and the patient, a rather nervous young woman, said immediately afterward that it was not as unpleasant as having a plaster cast taken of the mouth for dental work. The indications in this case were imperative, the case being one of long standing with distressing symptoms. The middle turbinate is always removed in all or in part, depending upon whether one wishes to remove all of the cells, both anterior and posterior, or only the anterior.

The frontal sinus may be opened by the external route and if it is to be opened this is the only safe way to do it.

Several procedures have been advocated for opening the frontal sinus from within the nose. None of them are accurate and safe. The anatomy of the parts to be thus operated is too variable to admit of safe work in all cases and there is no way of determining the cases in which such a procedure would be safe. If we have both frontal and ethmoidal disease and have decided on opening the frontal sinus we may at the same time operate on the ethmoid cells through the frontal opening. However, the great majority of the frontal sinus cases will respond to appropriate intranasal measures. By this is meant the removal of all obstructions blocking the normal opening of the frontal sinus into the nose. This is a very simple procedure and has been found, when combined with irrigation and instillations, to give relief in the large majority of cases. When we have polypi within the sinus the external route is the only means of removal.

The sphenoid sinus should be opened by removing, as a preliminary step, the entire middle turbinate bone. In the cases in which we have marked atrophy of the middle turbinate we may be able to work on the normal opening of the sphenoid without removing it. After this is done we have two procedures at our disposal. First, the enlargement of the normal opening of the sphenoid sinus which may be accomplished by cutting away the anterior wall at this point. It must be borne in mind, however, that the anterior wall at this point is very thick except down and externally to the opening and appropriate bone cutting instruments must be used. The other route is through the ethmoid cells. When the posterior cell is reached, which is oftentimes as large or larger than the sphenoid itself, it will be found that the wall separating the two is very thin and easily punctured. When this opening is made we have drainage at the bottom of the sinus, the advantage of which

is obvious. The normal opening at the top aids in the drainage. When the ethmoid cells are not diseased it is advisable to attempt opening through the posterior ethmoid cell without disturbing the cells anterior to this. The opening of the sphenoid through the antrum of Highmore has been advocated. The antrum must be opened through the external wall, then an opening made at the extreme limit of the posterior superior internal angle of the antral cavity. At this point the anterior wall of the sphenoid, the posterior ethmoid cell and the antral cavity meet. With this point in mind an opening is thus made which goes through the anterior wall of the sphenoid by way of the posterior ethmoid cell. The exact direction of the instrument is very important as a slight deviation will be not only ineffectual but may be quite disastrous, the sphenopalatine fossa with its important structures lying adjacent. The antral route is mentioned only to condemn it.

What are the dangers to be considered in the foregoing procedures? In the antral work they are absent. In the external frontal operation with or without removal of the ethmoid cells, one has only to study the anatomy of the parts involved to know them. The intranasal ethmoid operation requires an intimate knowledge of the anatomy of the parts and a mechanical appreciation of distances. Externally we have the eye, separated only by the lamina papyracea or eye plate above the thin cribriform plate separating the brain, and posteriorly the sphenoid sinus. One must not only know the normal relations but keep constantly in mind the variations. In the sphenoid opening we bear in mind the important structures lying in close relation to it. It is not often that the cavernous sinus is injured but it must be borne in mind that the bony wall separating it from the sphenoid is sometimes absent. The various dangers can be and should be avoided if the operator possesses a very intimate knowledge, a practical knowledge of the anatomical relations and at the same time possesses the requisite skill. The text-book study of the parts is not sufficient. No one would be justified in operating in these fields without having worked out the various problems on the cadaver.

I do not advocate operating unless the symptoms and findings, on very careful examination, indicate very conclusively that relief is to be had only in that way. We must have good

and sufficient reasons and must have the assurance that the result will entirely justify the procedure before undertaking it.

In the foregoing, I have purposely eliminated technical details. The preparation of the patient and the after-care is highly important. The same attention must be paid to sterilization here as in operations on other parts of the body.

The use of douches and sprays has not been touched upon. They undoubtedly have a very important place as adjuncts in the treatment of the class of cases under consideration in this paper. Too much dependence has been placed upon them in the past and in the presence of real pathologic changes they should not be depended upon to do what proper operative measures alone will accomplish. The habit of telling a patient to use a douche or oily spray and to continue its constant use for many years should be discouraged. They should be used with care and judgment and under the direct supervision of the doctor. Improper methods of douching the nasal cavities cause many cases of acute middle-ear inflammation and too much care cannot be exercised in this regard. Better not to use the douche than to use it improperly.

I have intentionally avoided the bacteriological aspect of nasal catarrh as being too large a subject to be taken up in a paper intended to be brief. Some work has been done along this line in the field of nasal disease, but it is only in its infancy. It certainly offers an enormous field for original and conscientious work. If the conditions which we now have presented to us for treatment and cure continue to be allowed to develop, the present methods will always be indicated. It is in the line of prevention that bacteriology offers us much encouragement for the future. I do not believe that serum treatment will ever take the place of or do away with the necessity for treatment as outlined in this paper, but it does offer us a very valuable adjunct in establishing a cure and in the prevention of the development of the conditions demanding extreme radical operative procedures. In the cases presenting no well-marked pathological picture but with symptoms, we certainly have a bacterial factor to contend with. It is in these cases that our present methods of treatment are not ideal. While it is true most of these cases develop in the course of time pathologic conditions which demand relief and which we do relieve, do we do more than restore these cases to a condition of less degree? Here, again, we have opened up a field for serum treatment.

In closing I wish particularly to lay emphasis on the necessity for early, adequate, and proper surgical relief in many of these cases. Confined pus or any form of confined infection demands the same surgical relief here as in other parts of the body. In fact, the demand is very decidedly more imperative. When we consider the very intimate connection between the lymphatics of the nasal cavities and those of the dura, it is amazing that we do not get meningitis more frequently than reports would seem to indicate. With a direct channel for infection, and no where have we a more inviting field than here, early drainage is certainly indicated. Nature has provided fairly good drainage under normal conditions, but where we have obstructions due to anatomical malformation or pathologic changes there is only one indication—surgical interference.

119 HALSEY STREET.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Epidural Injections as Treatment for Enuresis or Essential Incontinence of Urine.—Genaro Sisto (*Ann. de méd. et chir. inf.*, March, 1910) states that incontinence of urine has often its essential cause in lesions of the medulla acting on the vesical centers, the enuresis being simply a symptom. This is seen in spina bifida, paraplegia, and myelitis. There may be local causes in other cases. In spasmodic incontinence the motor arc is constituted by the peripheral conductor and the spinal cord; in incontinence allied to tic, the arc includes the cerebral cortex. To differentiate these two forms, we have to consider the hereditary conditions, seek for stigmata of degeneration, study the local condition, etc. In these cases epidural injections may be of great value. They should be made at the lower part of the sacrum in a triangular area formed by the sacral apophysis and two tubercles which may be plainly seen; this area is covered with a fascia which may be felt to yield in inserting the needle. Here the sacral canal has neither the dimensions nor the inclination in the child that it had in the adult. We need not fear to wound the spinal nerves or the terminal portion of the cord, which does not extend so low. This space is a location for absorption of solutions in contact with a large number of veins, and the circulation of drugs is very rapid. It is the ideal location for producing anesthesia, and has not the dangers of lumbar injections nor its technical difficulties. The author gives the history of a patient treated by this method. The injection is not painful and the

patient is allowed to lie down for a half hour after it has been made. The patient was radically cured of incontinence that had persisted for twelve years.

Sterilized Clothing for Infants.—Edmond Weill (*Arch. de méd. des enfants*, April, 1910) advocates the use of sterilized clothing and dressings to prevent infections of the skin of infants in the hospitals. In the crèche at the University Hospital at Lyons, it was found that skin infections were common in children brought there for other diseases, and that no matter what measures were adopted they did not cease to appear until the ward adopted the use of clothing that had been sterilized after being washed in the usual way. These skin suppurations then decreased very much in number. Upon an occasion when the sterilizer was undergoing repairs it was found that the suppurations recurred, as they did when the head nurse went on her vacation and left the ward in the hands of a novice. Tests of the unsterilized clothing made by cultures showed that clothing rendered sterile by the irons soon became contaminated with a rich bacterial flora. The plan was adopted of placing the clothing to be needed for each child in a sterile canvas bag which was then put in the sterilizer. It was not opened until needed for use, and then was found to be sterile. This stopped the appearance of the small pustules and erythema of the buttocks so often seen in children who suffer from diarrhea. It was found that these lesions were not only prevented but were cured when they had occurred, by the sterilized clothing. The skin of an infant should be considered similar to a surgical wound and should be treated in the same manner, with aseptic dressings.

Congenital Scoliosis.—Albert Mouchet and Jean Rouget (*Gaz. des hôp.*, May 7, 1910) say that congenital scoliosis is characterized by a primary malformation of the bodies of the vertebræ or an asymmetrical development of the spine due to a failure of nutrition of the bodies of the vertebræ at the time of chondrification of the primary connective tissue forming the vertebræ. It often occurs with other more serious malformations, such as club-foot, spina bifida, etc. It is a deformity of embryonic life which, owing to the late development of the vertebræ, does not show itself until the first half of the second decade of life. Various theories have been brought forward as to its causation; the mechanical, the nervous, the inflammatory, etc. The theory espoused by the author is that of failure of development. We find inequality of development of the two halves of the vertebræ, cuneiform deformity of one or two bodies of vertebræ, supplementary bodies, union of transverse apophyses of vertebræ, numerical variations of the vertebræ, arrest of development of one side of the skeleton, and limited atrophy of one side of the trunk in different cases. The first rudiment of the skeleton is the notocord; in the second month of intrauterine life chondrification begins, with two centers in each vertebra. Ossification begins in the third month, with three points of ossification.

Hence this difficulty began at the time of chondrification, with arrest of development of one or more centers of chondrification. In congenital scoliosis the torsion is generally absent. It is generally located in the dorso-lumbar region, rarely in the neck. It may be associated with kyphosis. A point of importance in connection with this deformity is the accompanying deformity of the pelvis in women. The form is an obliquely oval superior strait, with nonrotation of the promontory, flattening of the ilium on the side of the prominent sacrum and change in the shape of the ischium. This deformity is relatively frequent. The lesion is painless. Its evolution is fatally progressive, and prognosis bad. Treatment consists of an immobilizing corset with massage.

Games for Children and their Influence in Hygiene.—Delobel (*Ann. de méd. et chir. infant*, My 1, 1910) says that games are of importance to the health of children. They aid in the development of the body and of the intelligence; they increase the imagination; they employ the energy of the child. They give an outlet to the nervous energies. The joy of living and defending himself are necessary and valuable to the child. Calling out is the best form of respiratory gymnastics. Games must please the child, for pleasure is the principal necessity, the excitant of vital energy. Games and dances develop flexibility, agility, and harmonious use of the muscles. They aid in developing the maternal and domestic sense. Such games are superior to set gymnastic exercises.

Rare Forms of Congenital Hydrocephalus.—V. P. Joukovsky (*Ann. de méd. et chir. inf.*, May 15, 1910) describes the forms of hydrocephalus in which, with an increase in the amount of cerebrospinal fluid, there is not an increase in the size of the head. Instead there takes place a compression of the brain in which the cerebrum becomes atrophied. These infants die soon after birth. Illustrative cases are given by the author. Such hydrocephalus has developed rapidly after traumatism at the time of birth. Again it may occur from cerebral hemorrhage and obstruction of the aqueduct of Sylvius by a clot. One such case occurred in a patient who had Asiatic cholera while pregnant, and was five weeks in a hospital. Her general weakness lasted for a long time. Her child was somnolent almost from birth, did not cry, and took little milk. It became weaker and more sleepy until death from athrepsia when one month old. There was fulness of the fontanels. The cranial cavity was found empty except of fluid, and a few remains of the brain substance.

Morbid Associations and Immunization.—V. Hutinel (*Bull. méd.*, May 28, 1910) gives examples of the association of various infectious diseases, mainly in children; among others of typhoid with pneumonia, measles, etc. From these cases in which we see two severe diseases occurring consecutively in the same child, the author concludes that the second disease to appear is modified by the first. Typhoid is increased in its duration, its course is

more severe, its complications are more serious, and relapses more frequent. The author believes that the combination of two infectious diseases interferes with the natural immunization processes of the body, that less antibodies are formed, and the convalescence is thus interfered with. The resistance of the organism is lessened. In cases of syphilis and typhoid the signs of syphilis disappear when the typhoid begins, but after the fever falls, the specific lesions reappear, and sometimes with much greater severity. Experimental immunization of animals is interfered with by inoculation with another disease. This may be due to an interference with phagocytosis. Bacterial products lessen the activity of the leukocytes both directly and by their effect on the nervous system. The conclusion of the author is that two maladies when they are associated modify and aggravate one another and cause relapses by interference with the natural process of immunization.

Relative Importance of Bovine Infection in Human Tuberculosis.—W. H. Park (*Publication No. 1*, p. 20, Queen's University, 1910) gives a brief outline of work which has been done under his supervision in the Research Laboratory, Department of Health, New York, on a series of unselected cases. All cultures were isolated by inoculation of guinea-pigs whose lymph nodes were subsequently employed in inoculating the culture medium. The results of this work have led to the conclusion that there is no constant qualitative cultural difference between the human and bovine types of tubercle bacilli. Quantitatively, however, there is a marked difference in the great majority of cultures, so great in fact that almost without exception the type can be determined from cultures alone. This difference is constant in one factor only, viz., amount and rapidity of growth in early cultures. In classifying cultures according to this characteristic, we can broadly say that all bovine types of bacilli are dysgonic (sparse growth), and all human types of bacilli are eugonic (moderate or luxuriant growth). The best method for eliciting these differences seems to be the use of glycerine egg as a culture medium. Regarding rabbit virulence, it has been shown that the bovine type of tubercle bacillus in every instance causes a generalized tuberculosis in doses of .01 milligram intravenously, the tuberculosis being progressive and causing death of the animal. Human virus injected in the same amount produces no disease at all or lesions of varying severity in the lungs or kidneys or both, and never causing a progressive generalized tuberculosis. Even with 1 milligram, that is, one hundred times as much, the lesions are usually confined to the same organs, and though a very slight tendency to generalization is shown, there is never a generalized tuberculosis showing a marked progressive nature. The rabbits injected even with the larger dose live, as a rule, indefinitely, and if death should occur, the tuberculous lesions are usually not extensive enough to say that the animal died of this disease.

Thirty calf inoculations have given similar results. From statistics which he quotes the writer concludes that the proportion of deaths from tuberculosis which are caused by bovine bacilli is nearer 3 per cent. than 1.5 per cent. of the total.

Etiological Factors in Scarlet Fever.—F. J. Schamberg (*Penn. Med. Jour.*, June, 1910), in discussing the etiology of scarlet fever, says that it is important to consider the influence of certain factors that seem to increase the susceptibility of the individual to this disease. Among these particular stress is to be laid upon burns, surgical operations, particularly about the throat and nose, and the puerperium. He thinks that most of the scarlatinoid eruptions following cutaneous burns represent in reality the exanthem of scarlet fever. In many cases the scarlet fever syndrome is incomplete and various important symptoms of the disease are lacking in characteristic development. He cites the case of a colored child about two years of age admitted to the children's ward of the Polyclinic Hospital suffering from a deep burn of the face and arm. About twenty-four hours after admission, the patient's temperature rose to 105° F., and a scarlatiniform rash appeared upon the body. Nothing characteristic was observed in the throat or upon the tongue. The diagnosis was reserved, as the symptomatology was regarded as too incomplete to warrant a positive diagnosis of scarlet fever. The child was isolated in a private room far removed from the children's ward and a special nurse was assigned to his care. In about four days, the nurse contracted a well-pronounced attack of scarlet fever which ran a favorable course. Both the child and the nurse were removed to the Municipal Hospital for infectious diseases. The child some days later died suddenly with symptoms suggesting internal hemorrhage. There had been no scarlet fever at the Polyclinic Hospital. It is the uniform experience in our Municipal Hospital, in Philadelphia, that children sent to its scarlet fever wards with rashes following burns fail to contract scarlet fever, although exposed to the concentrated infection of many cases. The writer regards it as unsafe to treat a "burn" case with a rash in a general hospital ward with other patients. Burns seem to specifically lower the resisting power of the patient to the infective agent of the disease. Surgical procedures under anesthesia to a less extent, appear to operate in the same manner. The puerperal state, as has been mentioned, also lowers the resisting power of the patient to the scarlet fever infection. Not all scarlatinoid rashes after surgical operations or during the puerperium represent true scarlet fever. Such eruptions may be due to suppurating wounds. The writer holds that the desquamating epithelium of scarlet fever is not, within our knowledge, contagious, and that the continuance or cessation of desquamation is not to be regarded as the criterion upon which to prolong or interrupt the patient's isolation; that the infection resides in the pharyngeal, nasal and aural secretions and that scarlatinal

patients with discharges from these cavities must be isolated until such discharges cease.

Acidified Milk in Pediatric Practice.—J. M. Brady (*Arch. Ped.*, June, 1910) reports most favorably upon the use of acidified milk in feeding about 400 infants in St. Ann's Infant Asylum, some perfectly healthy, other with malnutrition or intestinal indigestion. The acidified milk feeding was begun in July as a prophylactic of gastroenteric intoxication. In hot weather the milk was boiled before being inoculated. In preparing the acidified milk the fresh milk is inoculated with the lactic acid bacillus and then allowed to ripen for twenty-four hours by standing in a warm room; it is diluted with barley water to the desired strength, and in order to raise the caloric value to the needs of the infant, a tablespoonful of cane-sugar is added to the quart of the mixture. For young infants one part acidified milk, two parts barley water, a tablespoonful of cane-sugar to the quart of the mixture was ordered. Older infants received one-half and two-thirds acidified milk with barley water; malt sugar was also used in place of the cane sugar when the gain in weight was not satisfactory. Where there was an intolerance of fat, skim milk was used. A failure to gain in weight with good digestion was met by the use of top milk. From the first, results were striking; young infants two days old received this seemingly irrational food and thrived on it. Cases of intestinal indigestion with much mucus in the stools did particularly well. No difficulty was experienced in returning to a modified milk diet when the first formula was made somewhat weak.

Undiluted Citrated Milk for Malnutrition.—F. Langmead (*Proc. Roy. Soc. Med.*, May 10, 1910) has obtained most satisfactory results in 80 consecutive poorly nourished infants varying from three weeks to four months of age, fed with undiluted citrated milk at Paddington Green Children's Hospital. All gained weight. One died of epidemic diarrhea. Two grains of citrate or soda are added to each ounce of the undiluted milk, usually in the form of a watery solution, 1 dram of which is added to each feeding after bringing the milk to the boil. The child is weighed at first weekly and subsequently every two or three weeks and the amount of milk is adjusted according to the baby's weight and general condition and the mother's account. Citration is gradually lessened at about five months and can usually be omitted altogether at about six months except in particularly delicate babies. One of the chief advantages of this method of feeding is its simplicity. The disadvantages of dilution, the bulkiness of the feeding, the complexity of frequent variations, the changes of artificially preserved or thickened cream, and of giving too little fat are evaded. The chief objection is the excess of proteid; but this excess is simply passed by the bowel. Constipation does not seem to be more common than with other methods of feeding. Thirst is easily relieved by water between the feedings. Citrated milk is, of course, not

suitable for those rare cases which will not tolerate any milk or in epidemic diarrhea, and is not any advantage in cases of hypertrophic stenosis or other obvious organic cause of malassimilation. Acid dyspepsia as a cause of want of development calls for sodium bicarbonate in addition to the citrate.

Ulceration of the Frenum Linguae in Whooping-cough.—E. Apert (*Bull. m d.*, June 11, 1910) describes a symptom of whooping-cough which occurs in about 50 per cent. of children who have the disease. This is a linear superficial ulceration of the free border of the frenum linguae, sometimes covered with a false membrane and giving at other times gray scrapings that consist of degenerated epithelial cells, multitudes of leptothrix bacilli, and white blood cells. It appears generally in the second to third week of the disease, but may be delayed and appear at the sixth to the eighth week of the disease. Out of 252 cases seen by the author it appeared in 111, and in 105 of these in the classical situation in the median line. Occasionally it appears at one side. This ulceration may be due to friction, or according to others is a specific ulceration. The treatment consists in washing the mouth with peroxide of hydrogen diluted with water.

Recurrent Furunculosis in Infant Showing an Unusual Blood Picture.—Medwin Leale (*Jour. Amer. Med. Assn.*, 1910, liv, 1854) records a case of recurrent furunculosis in an infant four and a half months of age, the lesions yielding a pure culture of *staphylococcus pyogenes aureus*. The attacks ceased only after a course of injections with an autogenous vaccine. The case is reported as being unusual on account of the large proportion of lymphocytes present, the three differential counts showing small lymphocytes, 61.8 to 69.2 per cent.; "large lymphocytes," 25.2 to 34 per cent.; polynuclear neutrophiles, 1 per cent.; eosinophiles, 0.8 to 3.8 per cent.; basophiles, 0.2 to 0.8 per cent. The writer excludes many causes of lymphocytosis, lymphatic leukemia, status lymphaticus, etc. (As the only complete blood count made showed red cells, 4,800,000; white cells 3,000, it would seem not improbable that this case was merely one showing a poor resistance, as evidenced by repeated attacks of furunculosis and low total leukocyte count, in view of the fact that infants normally show a high lymphocyte count. The lymphocytosis can hardly be termed a high absolute lymphocytosis since the total leukocytosis, 3,000, is so extremely low for an infant only seven months old. No blood count is recorded to show the condition after the improvement which followed vaccine treatment.)

Spinal Anesthesia in Children.—In a paper on his third series of 100 cases of spinal anesthesia in children, H. T. Greay (*Lancet*, June 11, 1910) says that the puncture should be made in the second or third lumbar intervertebral space after primary anesthetization of the skin with 3 per cent. eucaïne, the patient being in the lateral position. The child should be immediately turned over on the back and the pelvis raised for about fifteen

to twenty seconds, always remembering to keep the head and shoulders elevated. By this means the heavy dextrin carries the stovaine to the lowest point; this can be regulated by the curve of the back. The preparations for operation may be commenced directly the child has been turned onto the back, for by the time these are completed anesthesia will be sufficient to make the incision. The level of the paralysis is regulated: (a) By the bulk of fluid used—the larger the bulk of fluid the higher will be the resulting anesthesia; and (b) by the position of the patient. The duration of the anesthesia can be regulated to some extent by: (a) The quantity of stovaine administered. The higher the anesthesia extends, the longer will any part below its level remain anesthetic. If the needle is not accurately introduced, so that the whole of the distal lumen is well within the spinal theca, a variable and incomplete paralysis may result which, though possibly sufficient for the operation required, will not last as long as a similar dose introduced well within the theca. Retching is to be anticipated if paralysis has involved many of the intercostal muscles. Respiratory pallor is to be expected in a mild degree when the paralysis is high enough to alter the character of the respirations. It is transitory in nature, being easily restored almost to the normal by brandy or by otherwise stimulating the patient, and so inducing a forced inspiration by the overaction of the upper intercostal and accessory respiratory muscles. Feeding during operation is permissible and even advisable in some cases when anesthesia is not required above the tenth dorsal segment. If the paralysis is higher than this, feeding is contraindicated because in high paralysis the stomach is usually distended (sometimes to a considerable extent), and in this condition the presence of food is liable to induce vomiting. Shock after grave operations is much reduced; pain is much less prominent than after general anesthesia; the danger of post-anesthetic pneumonia, bronchitis, acute pulmonary phthisis, "delayed chloroform poisoning, etc., is much diminished. The use of spinal anesthesia is indicated in long operations upon those suffering from cardiac lesions.

Acute Infantile Encephalitis.—Jules Comby (*Post-Grad.*, 1910, xxiv, 597) says that acute encephalitis frequently occurs in young children and has long been mistaken for meningitis. The lesions are either diffuse or circumscribed, bilateral or unilateral; they pass from congestion and cellular infiltration to degeneration of the nerve cells with intense polynuclear infiltration around the small vessels. Sometimes microscopic abscesses may be observed. In the middle of the encephalitic foci thrombophlebitic lesions of the small cerebral veins may sometimes be distinguished. Acute encephalitis may involve the various parts of the encephalon, the cortex, the white substance, the central nuclei, the starting-points of the cranial nerves, the protuberance, the bulb, etc. These lesions may be associated with those of poliomyelitis and of polyneuritis. Acute encephalitis

may occur at any age, perhaps also during intrauterine life. It occurs as a primary infection, but it often follows after an infectious disease or after an intoxication, such as influenza, whooping-cough, typhoid, diphtheria, mumps, enteritis, cowpox, etc. In some cases a nervous predisposition can be observed. It begins with convulsions, coma and paralysis. The convulsions may be single or multiple. Generally, there is no rigidity of the neck, nor other meningitic features. To these initial symptoms are often added spasmodic or paralytic paroxysms and contractures, choreoathetosis, delirium, interference with the faculty of speech, aphasia. Later, when the cure is complete, the child will retain spasmodic paralysis, tremors and psychic troubles, which sometimes produce idiocy and especially epileptic seizures. The prognosis varies much according to the degree and extent of the lesions; there are cases which rapidly end fatally, others in which the child may survive with incurable infirmities (hemiplegia, idiocy, epilepsy) and, lastly, others which terminate in a complete cure and without sequelæ. The diagnosis is principally based on the results which the bulbar function supplies. In meningitis, cytological examination of the cephalorrhachidian fluid reveals either lymphocytes or polynuclear cells; in acute encephalitis this fluid is normal. The treatment includes application to the head of a bladder containing ice, revulsives to the back of the neck, calming lavage; later, potassium iodide and kinetic therapy.

Chronic Appendicitis in Children.—J. Comby (*Arch. de méd. et chir. des enf.*, June, 1910) says that acute appendicitis is always preceded by chronic appendicitis. The history of the patient often shows a susceptibility to sore throat, adenoids, rhinopharyngitis, hypertrophied tonsils, and other glandular hypertrophies. Any one of the infectious diseases may leave its effects in the appendix. Alimentary abuses, too much meat, irritating foods, voracity, lack of chewing of the food, and other gastrointestinal errors are frequent causative factors. Appendicitis is rare in infants, and increases progressively as they grow older. The symptomatology is complex and variable; all sorts of gastrointestinal symptoms are seen; emaciation, pallor, anemia and skin disease accompany this condition. Catarrhal icterus may be seen, cyclic vomiting, circulatory troubles, and arrest of development. There is a nervous form with neurasthenic symptoms. In girls the menses are painful. We must be guided in the diagnosis by the local signs, especially pain on pressure at the McBurney point. Medical treatment consists of regulation of the diet and hygiene, rest, and regulation of the bowels. Surgical treatment may become immediately necessary in any case.

Hemorrhagic Disease of the Newborn.—On the basis of two reported cases and the recent literature, H. Schwartz and R. Ottenberg (*Amer. Jour. Med. Sci.*, July, 1910) discuss this subject with special reference to blood coagulation and serum

treatment. They agree with others that impaired blood coagulation is the immediate cause of uncontrollable hemorrhages in the newborn. This, they believe, is probably due to destruction of, or interference with, the production of thrombokinase. Bacterial infection is the most frequent underlying cause of the disease, but syphilis alone can cause it without bacterial infection. The writers consider the value of serum injections doubtful and advocate the trial of transfusion when ordinary measures have failed.

Umbilical Hernia with Cardiac Ectopy.—Kirmisson (*Bull. méd.*, June 15, 1910) gives the history of an interesting case of congenital umbilical hernia accompanied by an almost vertical position of the heart. Umbilical hernias are of three great varieties; congenital, those which appear after birth, and those which are acquired in adult life. Congenital cases are subdivided into embryonic, that is, existent from the first three months of intra-uterine life, and those of the fetal period. Embryonic hernia has no cutaneous envelope. There is an arrest of the development of the ventral plates and eventration occurs from absence of the abdominal walls. The tumor is covered with a yellowish membrane, the amniotic membrane, from which the cord is detached; on its deep surface is a serous membrane; between the two is a gelatinous substance. The liver is generally present in the hernia and the membrane adheres to the liver. The destruction of the adhesions causes hemorrhage. Fetal hernia, appearing after the first three months of intrauterine life, has a complete skin envelope. The conditions are less serious than in embryonic hernia. Berger has collected thirty-two cases operated on since 1893, with twenty-six recoveries and six deaths. Umbilical hernia is sometimes seen in weak, premature infants of small size. The treatment of such cases should be a proper bandage with a suitable pad over the umbilicus. This if constantly worn generally brings about a cure before the fourth year of life. If at that time it has not been cured, operative interference is in order.

Sporadic Cretinism.—B. C. Stevens (*Lancet*, June 18, 1910) records the occurrence of sporadic cretinism in four children in one family, the oldest being nearly thirteen years of age. The remaining child, ten months old, had not yet shown signs of the condition. Those affected had all grown well until three years old, when growth was retarded and the thyroid enlargement began to appear. The thyroid gland was generally enlarged in all, though one lobe was more prominent in each. The family history was absolutely negative as regards parental illness and previous cases of cretinism.

Status Lymphaticus.—G. H. Cocks (*N. Y. State Jour. Med.*, 1910, x, 325) believes that the diagnosis of status lymphaticus as a cause of death is made too frequently. Hammar's statistics show that the thymus gland is normally much larger than is generally supposed. Mechanical tracheostenosis undoubtedly

exists as a cause of death in rare instances. The usual cause of death in status lymphaticus is probably a "hyperthymization" of the organism, which renders it peculiarly susceptible to harmful external influences, such as shock, anesthetics and infectious disease. The X-ray offers the most certain and reliable means of determining *intravital* the presence or absence of an enlarged thymus gland. If status lymphaticus exists, chloroform is the most dangerous anesthetic. The writer reports briefly ten cases from the records of the Bellevue Hospital, Pathological Department.

Infantile Acromegaly.—L. Babonneix and G. Paiseau (*Gaz. des hôpitaux*, June 10, 1910) give the history of a case of acromegaly treated by himself, and cites many such cases from other writers, in order to show that the disease is far from rare, and should enter into the serious consideration of physicians. Most text-books pass over it by saying that it is extremely rare. In the author's case there was a marked increase in size of the extremities and the tongue, and intellectual troubles. There was concentric decrease of the visual field on the right, and increase in size of the sella turcica shown by a radiographic examination. The patient was a heredo-syphilitic. Glycosuria was absent and there were some symptoms of cerebral tumor; these were visual troubles, from compression of the optic chiasm, and lessened intelligence. There was also a tendency to obesity. This disease must be differentiated from congenital hypertrophy, precocious gigantism, and leontiasis ossea. In congenital hypertrophy the increase is general and there is no tumor in the sella turcica. In gigantism the whole bone is affected, and there is an increase in the entire length, while in acromegaly the ends of the bones alone are affected. Tumors of the hypophysis may not through their entire course affect the bones so as to produce acromegaly. Acromegaly or partial gigantism may be the consequence of cerebral lesions which do not affect the hypophysis, especially tumors of the pinea gland. Anatomical alterations of the hypophysis may cause lesions quite different from those of acromegaly.

Hydrotherapy in the Treatment of Infectious Diseases of Childhood.—P. Nobécourt (*Jour. de méd. de Paris*, June 4, 1910) gives the uses and indications for baths in the infectious diseases of childhood. He divides baths into hot, cold and warm, according to their effects. Cold baths should be used exceptionally in children and with much prudence. They should be given at a temperature not less than 20° C.; the duration should be three to five minutes, never more than eight to ten after three years of age. If shivering takes place, the child should be immediately taken out of the bath. The intervals should be from three to five hours. The cold bath causes vasomotor constriction at first, followed by dilatation after reaction, and relief of internal congestion. The heart is at first depressed; afterward stimulated. The cold bath stimulates the nerves, reduces

temperature, and causes diuresis. The hot bath is revulsive, sedative, and antithermic. The temperature should be about 38° C. and the length of bath ten to fifteen minutes. The warm bath improves circulation and respiration, and causes diuresis. Its temperature is 32° to 33° C., and the bath is prolonged. It may be gradually cooled or gradually heated at pleasure. Affusions should be made by placing the patient in a bath wrapped in a sheet; they should be cool or cold.

Acute Purulent Arthritis in Nurslings.—Ugo Trinci (*Riv. di clin. ped.*, June, 1910) says that purulent arthritis is comparatively frequent in nurslings, with fatal result when the pus is not removed by operation. It may be due to local or general causes. The author divides the causes into predisposing and determining; among the determining are penetrating wounds, lymphangitis, bursitis involving the joints, and osteomyelitis by propagation from septic lesions. The predisposing causes are infectious diseases, such as pneumonia, typhoid, pyemia, erysipelas, and gonorrhea. In some cases the primary disease has given a port of ingress for the germs of other diseases. In another category the arthritic process is a part of a morbid whole. Unhygienic conditions and feeding may determine the explosion of an arthritis; so also hereditary syphilis may begin the disorder. The principal microorganisms found in these joints are streptococcus, staphylococcus, pneumococcus, and gonococcus, the latter causing suppuration of syphilitic lesions. Syphilis acts only as a predisposing cause. These lesions begin in the first three months of life, never after seven months. The most frequently attacked joints are the knee, thigh, shoulder, wrist, and ankle. The most important lesions are those of purulent osteomyelitis; they generally involve the epiphysis. This may result in detachment of the epiphysis, purulent lesion of the junction with the diaphysis, rupture of a subperiosteal abscess into the articular synovial membrane, or infection by the lymphatics of a serous effusion into the joint. The agent which generates the condition is the streptococcus, staphylococcus, or diplococcus. The onset is sudden with fever, pain, and general bad condition. Palpation is painful. There may at the same time be a pyemia in the mother. Blenorrhagic arthritis is secondary to an ocular infection, not a genital infection, and never appears before the eighth day of life. It is always non-articular. The diplococcus reaches the joint by the way of the blood. The prognosis depends on the general condition of the patient, the special pathogenic agent, whether there be a bone lesion or no, the number of joints attacked, and the early period of operation. If the joint be drained early the result will be good, and the joint will regain mobility.

Treatment of Whooping-cough by Fluoroform.—Mathilde de Biehler (*Arch. de méd. des enf.*, July, 1910) give the results of the observation of 232 cases of whooping-cough treated with fluoroform solution, with success. The author claims for this

medication that it shortens the attack by some weeks, and renders the attacks of cough less frequent and less severe. Of the patients 185 were seen at the beginning of the disease, and 117 at the end of two or three weeks. In thirty-eight cases treated from the beginning, in families in which there were already other cases, a cure was obtained in ten to fifteen days. In 186, cure was obtained in three or four weeks; in eight, at the end of seven to eight weeks. In these cases the number of attacks of coughing was much decreased. In eighteen cases there were complications. There were four deaths, two from pneumonia, with meningitis in very young infants, when treatment was not begun until several weeks had passed. The author observed no sublingual ulcers, vomiting, or hemorrhage. Fluoriform is a drug that merits the attention of the practitioner; it is not poisonous, even in large dose, and is well borne by even the smallest children. The author thinks it quite possible that it will prevent the disease, as well as modify its severity. In the case of a woman in danger of abortion from whooping-cough the use of this drug stopped the vomiting and lessened the cough so that the pregnancy went on to term and the infant was delivered normally. By examining the blood of the little patients it was seen that the leukocytosis that always occurs in this disease began to diminish as soon as the drug was used. The dose of the solution should begin at ten to fifteen drops three times a day and after each attack five to ten drops, up to 200 or 250 per day. It should be increased until the desired effect is obtained.

Mental Troubles in Chorea.—André Pelissier (*Prog. méd.*, July 16, 1910) states that mental troubles in chorea major present themselves in protean type. When chorea follows measles, scarlatina, typhoid and other infectious diseases it is difficult not to admit that it results from such infections. The author considers the mental troubles to be the result of toxic-infectious substances acting on the brain. Hallucinations, disorientation, and confusion of mind are common. The author gives the history of an interesting case in which a young girl with a syphilitic heredity who had an attack of acute chorea, after sudden cessation of the movements had a confusional syndrome, then a catatonic state. She then returned to the choreic phase. Infection was the primary cause of this condition. A psychopathic heredity is generally present in these cases upon which the poisonous substance acts easily. Catatonia accompanies or follows epilepsy, hysterical convulsions, chorea, manic-depressive psychoses, and dementia precox. It is a frequent syndrome. In the case reported chorea, mental confusion, catatonia, and chorea again were the manifestations of a single infectious cause.

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OBSTETRICS AND MODERN GYNECOLOGY. *

BY

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ANOTHER year has passed and we meet again in annual session, to exploit our opinions on subjects prescribed by our constitution, relating to obstetrics, gynecology, and abdominal surgery. This association is composed of men trained especially in these departments, and the purpose of this meeting is to glean from the experiences of our associates the advances that have taken place during the past year in affections in these special fields, and to herald them to the world through the medical press and our transactions, for the benefit of the human sufferer.

That we should not enter lightly upon the deliberations of the subjects that come before us, I know is the feeling of every Fellow of the Association. As torch-bearers we should proceed with such caution that all who read may be profited. The recommendations here made should tend by their precepts to lessen suffering and prolong lives.

The scope of our work has gradually increased since the knowledge of bacteriology has illumined our way to a more accurate diagnosis, and given us a known pathology. Time is so fleeting that it seems but yesterday that these results were attained, while in reality it is within the memory of the founders

¹The President's Address delivered at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists at Syracuse, September 20-22, 1910.

of this association. In 1882, I heard J. Marion Sims, a pioneer American gynecologist, make this statement in an address before the learned medical profession of Baltimore: "I believe it will become possible to open the abdomen in gunshot and stab wounds, to repair and thereby lessen the mortality attending these injuries." He was listened to with rapt attention; some of his hearers had made history by their surgical ability. At the close of his address, the president of the meeting called for opinions referable to his prophecy. There was no reply until the student bodies present, as in one voice, called for Julian Chisholm, an ophthalmologist, who had been an army surgeon of wide experience, to respond. He was a modest man of a retiring disposition, and he did so reluctantly.

Sims had just returned from France where he had been surgeon to the imperial household and the nobility. With his white locks, erect figure, *suaviter in modo*, and free command of the English language, he made a marked impression. The strong, forceful manner of Chisholm, with his silver-tongued oratory, at once found lodgment with the audience, and all that Sims had said in support of abdominal exploratory inspection and treatment, was obliterated from the memory of his hearers by the clean-cut and forceful statements of Chisholm. A key to unlock the hidden mysteries buried in the recesses and caverns of the human anatomy, where speculations alone had been rife, was dangling unseen at the finger tips of Sims. In his master mind the seeds of advancement had taken lodgment; his observations and associations abroad had given him a foresight into the possibilities of the future, the possibility of surgery becoming a science, founded on findings that were indisputable.

With the advent of bacteriology came a new school of surgeons, whose knowledge was founded on facts, not theories, and like the mariner who consults his compass, had known laws to direct them. The field of gynecology, the pelvis, with the abdomen appended, was their hunting-ground, and like an army marching to victory the field was soon taken. Now all the organs of these cavities have felt the results of advancement, and have yielded of their pathology abundantly; aye, and not pathology alone, for the organs of this casket have even been maimed and sacrificed in their healthy state for reasons that at times would have shocked Hippocrates; and it should arouse each one of us, as it is the purpose of this association according to our constitution, to advance the knowledge of obstetrics, gynecology, and abdom-

inal surgery to its highest scientific attainment, to enlighten the general practitioner in all matters pertaining to these different departments, by eliminating the erroneous teachings, and accentuating the essential; "to stamp with approval all real merit, and extinguish sham."

The inception of this association came at a time when erroneous opinions still existed regarding the etiology and pathology of many diseases of the abdomen and pelvis, and the treatment was illy directed and limited in consequence. Then, as now, the greater percentage of diseases of the pelvis were inflammatory, and then their origin was unknown. With the advent of bacteriology, the pathology of inflammatory troubles became known, the diagnosis confirmed, and rational treatment in this class of cases was instituted, as far as surgical methods were concerned. All that had been done previous to this period was founded on fallacy.

The knowledge of the real etiology robbed surgery of its terrors, and opened the pelvic and abdominal fields for investigation through a perfected technic, with but little fear of serious consequences attending thorough exploration, thereby revealing the living pathology, and rendering arrest or elimination of disease possible. This was a great advance forward, but as these organs have to be considered not only from the standpoint of organized pathology, but the elimination of conditions that arrest their normal development and physiological functioning, there still remain problems for solution—conditions that should not be considered from end results, but from the standpoint of the purpose of medicine to prevent diseases, and keep the human body in a state of perfect development.

Not only those that are doing special work in gynecology, but the general practitioners as well, are looking to us for the solution of unsettled questions in the departments this association represents. In the obstetrical art, marked results have been obtained through the knowledge of infection. From a heavy death-rate following confinement from these causes, the technic carried out in hospital practice has almost eliminated the mortality. It is to be regretted that conditions outside of institutional care have not been attended by similar results. Here the death-rate still is appalling, showing, if any, but slight improvement since the etiology of infection has become known. This should cause us to pause and inquire why these conditions exist, and if there is not a remedy.

THE PUERPERAL WOMAN.

The hospital environment having nearly eradicated puerperal disease through asepsis, the known cause in the home is the lack of asepsis. The solution then resolves itself into knowledge or ignorance, cleanliness or filth, in the care of the parturient. Investigations prove that the greatest source of infection is introduced into the birth canal through the vagina; the germs lurk about the vulva of the patient, or on the hands of the attendant. From the vulva they are carried in by examination and, if on the hands of the attendant, through inattention to the known laws of asepsis. Williams says the greatest advancement in the department of obstetrics, "is the elimination of vaginal examinations and the recognition of pregnant conditions through external means"; that a more thorough diagnosis can be made by these methods than by any other, and the danger of carrying infection by digital examination is eliminated.

The mortality attending confinement must diminish, for the medical man of the present has the knowledge of prevention of infection, and only carelessness or indifference can be his excuse. The attendance upon this class of cases by incompetent midwives, and the high mortality attending their service, is a reflection upon the medical profession, though there is no uniform law of requirement for midwives in this country. It is to be hoped that legislation will soon correct this great source of wrong, by establishing and demanding a course of study that will make them thoroughly proficient, if there is any excuse for their existence, or their practice is to be tolerated. Child-bearing, this greatest industry of human existence, should be protected by every known means, and not only attendants be required to know the laws of asepsis, but should be held accountable for their practice. As Lord Lister said in 1871, "The sooner the laws of asepsis are recognized and practised, the better it will be for humanity."

Public feeling has changed regarding the environment of the modern hospital, and the tendency is growing to accept protection here against serious consequences during parturition. This should be encouraged, for it is not only a means of saving life and preventing serious sequelæ to those that avail themselves of the advantages, but is a source of extending education to less fortunate ones. The hospital offers equal protection to the pa-

tient without means who lives in squalor as it does to the one of wealth surrounded by luxury.

There is still another means of contamination; many women at the approach of parturition are taught to anoint themselves, or use douches. These practices are unnecessary and unsanitary, often harmful, and may even be the means of fatal termination. The lubrications will only benefit through mental therapy, and the use of the douche, which is so common a practice with all classes, can be an agent for good only when advocated by the physician for diseased conditions. Nature is so kind in providing the vagina with germicidal action, that it may be questioned if the douche ever benefits.

We owe much to Pasteur and Lister for the knowledge of germ diseases and their treatment, but as prevention is not always possible, he who introduces a means of positive cure in these affections deserves a still greater reward. Serum therapy offers much and may be the means of solving the problem. With a known etology, our faith tells us time will produce the master hand, but until then every method of arresting infection should be practised; the greatest known means is prophylaxis.

Many theories have been advanced as to the etiology of eclampsia and the toxemias of pregnancy. In the multiplicity of causes given, the most must be wrong, some right. It is to be deplored that the treatment founded on the findings has not materially lessened the mortality. Through the thorough investigation in progress at present, may we hope for more enlightenment in the near future; may some means be recognized to stay these affections that have so long withstood the hand of progress!

GYNECOLOGY.

In the field of gynecology the disease that stands as a lone sentinel against the advance of science, yielding not its etiology, is cancer. Having existed since the early history of medicine, it has withstood all investigation; while all forms of maladies have crumbled in ruins about it it has continued its ravages, until many thousand people in the United States are dying annually of this disease. Confined to the pelvic organs, it has its inception for the most part in the cervical part of the womb, and we are taught, and are teaching, that it is due to the lacerations that have taken place in childbirth

or from some traumatic cause; and it would seem rational that lines of treatment (while we are waiting for a known etiology) be carried out on the same lines advocated in other parts of the body.

Cancer of the breast, recognized and treated in its inception by early operation, has given a greater percentage of cures and materially lessened mortality.

In the stomach, Moynihan is teaching us, in his "Pathology of the Living," to recognize the significance of symptoms earlier. It is the consensus of opinion that cancer here has its origin on the site of an ulcer. Prophylactic treatment prevents the cancer by curing the ulcer. Prophylaxis must be introduced in the prevention of cancer of the womb by early repair of lacerations. Much discussion is taking place regarding the etiology, prevalence, and ravages of this disease. The symptoms are so suggestive of the pathology of the living in this class of cases that the first knock at the door should arouse suspicions of its presence and lead to a conclusion through investigation. While similar symptoms might be present in so many conditions, it would be good detective work to apprehend the thief before the work of destruction is so far advanced, and thereby save a life. In many instances the symptoms are so masked that suspicion of the disease is not excited; more often the symptoms fall upon deaf ears—"None are so deaf as those that will not hear."

Traumatism being the accepted factor in inducing cancer in the breast and cancer following upon or secondary to lesions in the viscera, as stomach, gall-bladder, pancreas, lips, and the like, by analogy, its increased frequency at the neck of the womb in parous women with lacerations would show trauma to be an exciting cause for its existence there, encouraged through the degenerations that take place; as a preventive measure, repair of the injuries would in many cases arrest it. In an article read before the New York Obstetrical Society, Levin, connected with Columbia University, in the Department of Pathology of the College of Physicians and Surgeons, states, "According to statistics gathered, lacerations of the cervix are not an etiological factor in inducing cancer; that it occurs with the same ratio of frequency in the cervix of the virgin as in the parous woman." This has been contrary to the teachings of gynecologists, and in my own observations I have seen but one case in a virgin; this was polypoid

in its inception and apparently innocent to the eye. The pathologists pronounced it carcinoma.

If the opinion of the profession is erroneous and founded on assumption, let us have facts. The observations of Levin cannot be ignored; his conclusions are based on scientific findings and merit the careful consideration of the Fellows of this association. It would be well if the experience and findings of this body during the next year were tabulated and presented at our next annual meeting, according to the suggestion he makes. He further states, "Our present knowledge indicates only that by prophylaxis in cancer of the uterus is meant the observation of hygienic measures during the time of puberty, menstruation, and the sexual life of the woman generally, all of which apparently is more important than repair of lacerations," but his next paragraph acknowledges he has no proof for the statement.

With these facts based upon scientific record and with a knowledge of its increased frequency founded upon scientific conclusions of all investigators, that cancer is local in its inception and that it may be permanently removed by early operation it is important we should urge an earlier recognition of its presence by demanding a crusade of education to women and doctors; to hark, listen, look for danger; to appreciate the first symptom and prove its presence through the means at our command.

Medical journals are teeming with reports of investigations made in our research laboratories to ascertain the cause of cancer, to a greater extent probably than of any other disease. These laboratories, lighthouses of investigation, have shed their light upon so many hidden mysteries and simplified the apparently impossible that we hope we are at the dawn of enlightenment as to the etiology, prevention, or cure of this King of Pathology. All investigators being unanimous that it is local in the beginning and that it can be cured by surgery alone at present, let us not be indifferent to our duty in recognizing it early, that we may lessen its mortality until it is at least as small, or less than the mortality of cancer in any other region. Let us not, by our inactivity, increase the shadow that hangs over humanity through this great scourge.

I would call the attention of the association to inflammatory affections of the pelvis, the most common of all diseases, and which cause the greatest amount of physical suffering. These

affections originate from causes long recognized, and give rise to pathological lesions, which not only exclude the sufferer from a useful life, but lead to semi-invalidism, invalidism, and frequently death. They become a prime factor in race suicide, by arresting the normal functions of the procreative organs and destroying the purpose of woman's creation. In their etiology, they are due to microorganisms which are no respecters of persons, visiting the babe as it makes its advent through the birth canal, or the aged and infirm.

In nearly all affections having a known etiology, lines of treatment have been instituted to arrest their development, and to stamp out their existence. As gynecologists, we have been slow to impress upon the public, and enlighten women especially, of the great dangers that threaten them through ignorance of these diseases that are liable to be brought to them through unsuspected avenues. The subject has been so enshrouded in mystery that boys and girls have grown to mature manhood and womanhood, ignorant of the laws that should govern their sexual lives, for fear that the knowledge of these diseases might lead to contamination. The home circle is the altar from which instruction must come, and the truth to the growing child from this source will stand against all other avenues of enlightenment. This knowledge, confirmed and strengthened by proper teaching in the public school, will do much toward lessening the great amount of suffering through the many sources by which gonorrhea and syphilis may be carried. It is not the purpose of this paper to treat of the social evil, but as a factor in the diseases we are compelled to treat, we should all be enlisted as soldiers in the crusade to eliminate its influence and spread.

We have been able to do but little in the arrest of gonorrhea. While nearly all treatments have been founded upon the etiology, treatment of the ravages of this disease has been founded upon the pathology and has been a removal of diseased parts—a treatment of end results rather than prevention. The glamor of surgery which came with the knowledge of these affections, may have caught us on its current, and not only carried us into shallow places, but stranded us upon sands. Regardless of the wonderful advancement wrought through the development of modern surgery, may we not have wandered in our reasoning and failed in our judgment to give the best, wisest, and may I not say, most honest consideration and treatment to this

class of diseases. At all times it should be our ambition to protect woman's body, and preserve it as the typified image of the Creator, the most beautiful and crowning effort of creation.

If we were to make our application from the pursuit of agriculture, horticulture, or the care of domestic animals, would we be content to let these ravages continue? A horticulturist, observing that his choicest shrubbery and plants were showing decay, the leaves turning, or the ends of the branches dying, after thorough investigation, discovers the evil at the roots in the form of worms that were preventing the life fluid from reaching the remote parts of the plant. He does not endeavor to restore a state of health to the plant by cutting off the dead and dying parts, but kills the worms, the underlying cause of its destruction. In the surgery of the inflammatory diseases of women, the greater part have the same etiology. Still we are pruning and trimming, rather than arresting the known etiology. If death does not follow, a life has been prevented from fulfilling its purpose, the propagation of the race.

If we are unable to check the cause, the germs of infection can at least be given a much lessened influence through prophylaxis; by teaching to the uncontaminated girl or young woman, at a time when her mind is free from sexual thoughts, the dangers that threaten her, and to the young man as well, the possibilities of such infection. By such teaching some may be hurt, but the knowledge of right is more powerful than ignorance; the light will dispel the darkness. To the growing child the true is as easily accepted as the false, and coming from the home will live longer than from any other source.

Conditions that in their treatment simulate the inflammatory are those of arrested development. The young girl, who is forced to use all her nervous energy in the development of her mind, in grammar, high school, or college, at a period when the special organs of generation are developing, fails to menstruate, or if this function has been established the expenditure of energy arrests it, and the organs even atrophy. At the close of the mental application, nature attempts to reassert herself, but fails, and the surgeon prunes away the embarrassed organs. Temporary relief follows to the perturbed mental attitude; the surgeon rejoices that he has been made an instrument for the relief of suffering womankind, and there is no compunction of conscience that a law of health has been violated, and a promising life doomed to disappointment. Gynecology in its inception

should begin as with the tender plant. Proper environment should be placed about the growing child, to aid in development and to protect when danger threatens, thereby promoting a stronger, healthier body.

EUGENICS.

It is not only the duty of the physician to carefully look after the surroundings and direct the course of the growing child, but as well to look to the betterment through eugenic laws, demanding of the parent a healthy body. "According as a man soweth, so shall he (his offspring) reap." The laws that are so thoroughly recognized and practised in the vegetable and animal kingdom, are still more applicable in the human, and deserve recognition from the obstetrician and gynecologist. The laws being introduced into some states to regulate marriage and eliminate disease for the betterment of the race should become universal, and the movement that had its inception in England to meet these conditions, is worthy of our consideration. That we do not raise figs on thornapple trees is a law that we have been slow to recognize. The horseman has learned that it is possible to breed for speed, might, and endurance, and this law is proven in all departments of domestic life.

To eliminate the diseases that materially effect the department of obstetrics, and especially syphilis, will not only contribute much toward lessening the mortality of infants *in utero* and early life, but result greatly in the betterment of the race. As this is a communicable disease, every effort should be made to prevent its entrance into the system of the uncontaminated by enacting laws similar to those in Indiana, making it a crime to marry where one has this disease, punishable by a fine of \$200 and possible confinement in prison. Every means of prophylaxis should be practised to eliminate this affection which is visited on the second and third generation. In the rapid progress of medical science, while we have rejoiced over the arrest of so many maladies, may our voices be raised and our hearts gladdened by the hope that Ehrlich's discovery may lead to the lessening or eradication of syphilis, of all inherited diseases the most far-reaching in its consequences.

While at the inception of gynecological practice, the real pathology could not be understood; this is now history, for enlightenment came through the knowledge of microorganisms, and with

the advanced means of diagnosis the specialty advanced rapidly. The sufferers of the pre-antiseptic and pre-aseptic periods were deserving of great sympathy, as then the mortality attending operative methods was high. Those that are in need of surgical skill at present are living in an age of perfected surgical science, with but few deaths attending operations. This has become so thoroughly recognized by the laity that they have become common prey for the charlatan and unprincipled surgeon. I think the fellows of this association will bear me out if I should say, that a considerable percentage of the abdominal and pelvic operations performed to-day are unnecessary and unwarranted.

If this number was due to lack of knowledge in diagnosis, it would not be so difficult to reconcile, but to feel that a gullible community is being made the prey of fakirs, or that the people have no means of differentiating ability from chicanery, is a matter for regret and reflection. Have we as a body any duty to perform to regulate these abuses? Or are they to go on, and unprincipled and inexperienced surgeons be allowed to rob woman of her organs, maiming her health and arresting the purpose of her creation? This practice applies not only to women, but to a large percentage of the abdominal operations on men as well.

That there will always be in the profession those whose motives are only for gain and whom it would be difficult to divert from unprincipled practices, we must concede. Is there not some method by which the medical profession can regulate the practice of the incompetent? It is a fact that the fellows of this association were pathfinders, and had to blaze their way through the wilderness of existing conditions; but now, when the whole country can boast of its experienced and able surgeons, there is no reason why the beginner should not serve at the side of a master until he has become familiar with the details of the underlying principles. It might be well to confer a degree upon those who aspire to do surgery, after they have complied with a law demanding a proscribed amount of experience and time. That too much and too thorough teaching of surgery is demanded by the college curriculum is erroneous. Too much knowledge of methods is impossible; the lack of judgment in applying it is a more serious consideration.

I regret to chronicle the death of Dr. William H. Taylor of Cincinnati, which occurred at his home, February 6, 1910. The founders of this association will remember him with much pleas-

ure as one of the fifteen who met in Buffalo, April 19, 1888, to form the nucleus of this association. Twenty-nine responded to the call, and were enthusiastic for the organization. From those assembled, Dr. Taylor was elected president. He filled the position so acceptably that by the unanimous vote of the fellows, he was elected for the succeeding year. Through his administration, the association became so thoroughly founded that the work of his successors has not been arduous. To pay tribute to his life and attainments I leave to the pen of one who knew him intimately.

For the splendid program we have to consider I thank the fellows for their cooperation, and the ready response to the call for papers. Much credit is due our secretary for the indefatigable labor bestowed upon, and the interest manifested in the work of this association. To him is largely due our success. No detail is too small to escape his notice; no duty too arduous for him to perform.

I appreciate the great honor of my position as presiding officer of this distinguished body of surgeons, gathered in our modern Syracuse, from all parts of our country. I have realized the difficulty of presenting anything new for your consideration, but if the fragments which have appealed to me from time to time, and which I have recorded here, will even in a small degree contribute to the success and advancement of this association, I shall be gratified. I desire to thank you for your considerate attention.

326 MONTGOMERY STREET.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRI- CIANS AND GYNECOLOGISTS.

*Proceedings of the Twenty-third Annual Meeting, held at Syracuse,
New York, September 20, 21 and 22, 1910.*

The Association convened at the Onondaga Hotel, September 20, 1910, under the *Presidency* of DR. AARON BENJAMIN MILLER, of Syracuse.

Addresses of welcome were delivered by *Attorney* RUBIN, who acted as spokesman for the Mayor of Syracuse, and by DR. J. L. HEFFRON, Dean of the Medical Department of Syracuse University.

The response to these addresses of welcome was made by DR. CHARLES N. SMITH, of Toledo, Ohio.

WHAT HAS BEEN ACCOMPLISHED BY OUR ASSOCIATION.¹

BY

ALBERT VANDERVEER, M. D.,

Albany, N. Y.

At the meeting of the American Surgical Association, in 1887, the subject of the organization of the Congress of American Physicians and Surgeons, in the bringing together of the various special societies, was pretty thoroughly discussed. Later, some time before the annual meeting of 1888, Dr. William H. Masten, of Mobile, Ala., chairman of the committee on organization, informed me that the American Gynecological Society declined to participate. He was greatly disappointed by their action and was anxious to have another society organized that would include gynecology and, after further discussion, obstetrics.

It is not profitable at present to discuss the quiet undertone of opposition that existed in the American Medical Association regarding the Congress. These members were, in some instances, also Fellows of the special societies. After careful comparison of opinions on the question, it was deemed wise to organize the American Association of Obstetricians and Gynecologists. This

¹Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists held at Syracuse, September 20-22, 1910.

was done by a representative body of workers from a number of States, at Buffalo, N. Y., April 19, 1888. The professional atmosphere at this time was ripe for the development of such work.

The first and second decades after the Civil War were periods when positive specialization by members of our profession took root and advanced with great earnestness. Between the time of our birth and the meeting in Washington, in September, 1888, for the organization of the Congress, the American Gynecological Society had reconsidered their previous action and concluded to become a part of the Congress. This placed us in a very embarrassing position. Many of the members of the American Gynecological Society were anxious to have us as members of the Congress, but not with the title gynecology in any form. In the long and forcible discussions in the Executive Committee of the Congress, of which the writer was cognizant, many suggestions were made. We were urged to change our name to that of Pelvic Surgeons and upon this basis to be admitted, also to give the Society the name of the American Association of Obstetricians. This would have excluded the interest and energy of the abdominal surgeon with gynecological instincts and practice.

All these suggestions were declined, and in the final vote, although our position received the energetic advocacy of many of the best in our profession, we were outvoted by a small majority. The suggestion was made at the next meeting of the Congress that we drop the title of gynecologists and become an integral part of the Congress, but our Council has never recommended such action. At our meeting in Buffalo we elected Dr. William H. Taylor, of Cincinnati, Ohio, as our president, and I would advise every Fellow who at the present time has not read his inaugural address to do so. The high ideals there marked out we have endeavored to live up to. It is an historical fact of keen sympathetic interest that at this meeting a paper is to be presented, "In Memoriam, William Henry Taylor: An Appreciation," by Charles Alfred Lee Reed, Cincinnati.

Soon after our organization many other special societies developed, particularly the Southern Surgical and Gynecological Association, whose last meeting, at Hot Springs, Va., was a most memorable one, showing an amount of vigor, intelligent presentation and discussion of papers creditable to any society.

It impressed one greatly as in keeping with our own successful efforts.

The work of our Association along the line of cleaning up of pus in the pelvic has been one of the most impressive of that accomplished by any society. Few subjects have been presented so forcibly, together with the discussions, as that of pelvic abscess, its methods of drainage, its clear pathology in the involvement of the tubes and ovaries, and, finally, abdominal section with drainage; also the research study in pathology, presenting the etiological factors, all has given a most brilliant reward to the efforts of the various Fellows in relieving suffering and in making the understanding of these cases clear and distinct at the present time. The same may be said of all work within the pelvis. Few societies have accomplished more.

Its first series of papers on extrauterine pregnancy were most brilliant, particularly the line of discussion that has resulted in clearing up this field of surgery in such a masterful manner. The various special subjects that have been worked out with great care from time to time have made a strong impression upon the profession at large. Obstetrical questions, the use of the short, the long, and traction forceps drew out most interesting discussions that were practical and of great value to the general practitioner. The gradual steps in the treatment of fibroids; the extraabdominal treatment of the pedicle; how gradually it vanished under the close observation of the abdominal surgeon; and, at last, the intraperitoneal treatment in doing the supravaginal operation became the established method. The members of our Association can claim a full share of these advances in which early diagnosis and operations have been advocated.

In the repair of lacerations and injuries done to the female organs of generation during parturition the Association has shown a keen interest and advance in all of the various investigations and research made in this department. The volumes of its Transactions have been well received and reviewed with a fearless earnestness that has brought out other good points, setting men to thinking and considering their work in a spirit of better understanding, with general criticism beneficial to all concerned. It is not possible for one to consider individual papers or to go over the subject completely regarding the various symposiums held. The diagnosis and treatment of the septic uterus and appendages, from the obstetrical standpoint, has

been of great practical value. The subject of cancer of the uterus and of appendicitis, more particularly, has received most intelligent treatment.

The discussions at times have been sharp, keen, and beneficial to those in attendance and entering into the discussion of the subject presented. Many problems have been solved, many obscure subjects have been studied, and by the aid of the laboratory bacteriologist and pathologist solutions have been given bringing successful treatment. There are unsolved problems before us, perhaps no one so important as that of the etiology and treatment of tuberculosis of the female organs of generation and cancer. Let us continue to be faithful and sincere in our efforts, and proper reward will come. There is work for all.

Though the number of our special societies is large, yet in visiting them one is impressed with the uniformly good attendance and splendid work accomplished.

To the busy, hard-working practitioner the departments represented by our Association at its meetings are as valuable as an attendance upon postgraduate work. We become earnest advisers and consultants one to another. I am sure that the founders of this Association have presented an example of patient investigation of pathological subjects and in doing that which was necessary to relieve distress and illness, which can be safely carried out and made yet more perfect by those who are to follow.

Of the forty-three papers presented at this meeting, twelve apply to what we now understand as being classed with abdominal surgery and the work that is done very largely by the general surgeon, but which also applies to the gynecologist in many operative fields or surgical territory. By that I mean there are in certain localities gynecologists who feel it incumbent upon them to do this work, whenever it is essential to perform that which comes under their line of observation.

There are twenty-three papers that clearly belong to the field of gynecology, while seven relate especially to obstetrical work, one paper being unclassified. I have not gone over the list of other years, but have an impression that we have adhered very closely to the intent of our original line of work, and that to the younger men who are to follow us there is yet much for them to do. From their earnest investigations and writings much good will inure to the profession as a whole.

PRESENT STATUS OF THE COLON TUBE.¹

BY

H. WELLINGTON YATES, M. D.,

Detroit, Mich.

(With nine illustrations.)

WHEN I was asked to present a paper for this meeting I was embarrassed in the selection of a suitable subject. Reviewing the field, however, it appeared to me that a few moments spent in consideration of the so-called colon tube would not be out of place. Unquestionably a great difference of opinion obtains as to what one can and cannot do with the colon tube. The early interpretation of its utility depended upon the tube's passing through both rectum and sigmoid into the colon and thence upward. Until recent times, the greater majority of Englishmen, Frenchmen, and Americans have concurred in this belief. Nothnagel(1) (1898), Naunyn(2) (1896), and Boas(3) (1903) disputed this contention, these gentlemen denying that the tube ever passed the sigmoid. Other Germans, however, were as firm in their convictions that the tube could be passed high. Kuhn(4) (1896) claimed to be able to pass a metallic spiral spring into the colon by combined manipulation of the sigmoid. Later, by the aid of the radiograph, Schule(5) (1904) proved that this spiral spring never went higher than the sigmoid.

In 1903, v. Aldor(6), who perhaps is strongest in his assertion that the tube passes the sigmoid and therefore recommends the use of a 32-inch tube in the treatment of chronic colitis, on meeting much objection to his views, reaffirmed the same belief in 1905, submitting skiagraphs to prove his contentions. Faulty technic, however, in the making of the pictures did not fully demonstrate his claim. In his second paper, in 1905, he is positive that fluid introduced into the rectum alone and without the use of the long tube never in normal individuals goes higher. The absolute inaccuracy of this last statement would rather lend prejudice to the acceptance of his entire claim.

Other experiments have been carried on by Soper(7) (1909), Lilienthal(8) (1906), Rosenberg(9) (1905), and Haines(10). The later ones all give the same deductions—namely, that given a

¹Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists held at Syracuse, September 20-22, 1910.

normal individual, seldom, if ever, does the colon tube pass up to the descending colon. Deaver (1903) states that the flexible tube can be passed into the colon and, as a proof of this, says that when the tube is being passed, if water is permitted to run through it simultaneously, this is a key as to the certainty that the tube enters the colon. Indeed, I believe there is even now a large majority who hold to this last statement. The two later papers by Soper and Haines, dealing with the subject quite comprehensively and by the aid of numerous skiagraphs, rob me of originality in relation to this subject, but inspire a desire to

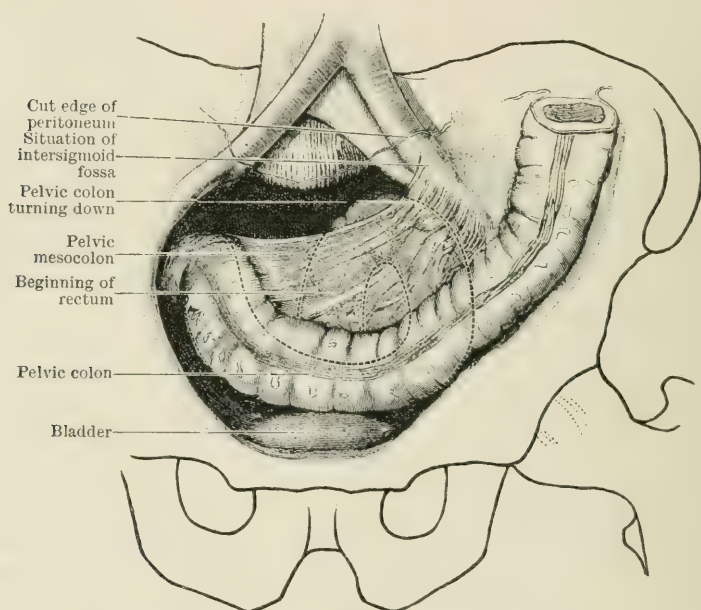


FIG. 1.—Anatomy of sigmoid (after Cunningham).

substantiate their findings and, if possible, to determine what we can expect from a continued use of the high tube.

By conjecture it will be perceived that I was a firm believer in the tube, since I determined for myself to carry on such work as would be necessary to fully substantiate my views as to its real or apparent good. The conclusions to these efforts could not have been possible but for the painstaking efforts of Dr. George C. Chene, who made all the skiagraphs and otherwise cooperated with me. I am also indebted to others of my medical friends who believed, as I did, that they could pass a colon tube into the

colon, and who, upon invitation, have attempted thus to do and ailed.

Notes on my skiagraphs will show that, having failed to pass the ordinary tube, I used other types of flexible instruments, such as the Wales bougie, large heavy-bodied soft-rubber catheters, metallic spiral coil, the flexible stilet of a horse cathéter,



FIG. 2.—Patient No. 1. Stiff rubber tube introduced in Sims' and dorsal positions. Skiagraph ventrodorsal.

different sizes, weights, and lumens of both rectal and stomach tubes, all with the same result. Much has been said regarding the position of the patient during this maneuver. I assume that persons upon whom we endeavor to pass a tube are ill, and therefore I have only asked the patients to place themselves in such positions as would be possible to assume while ill.

Among these are the dorsal, knee-chest, ventral, Sims's, and some modifications of these several postures.

As will be seen by the skiagraphs, we did not succeed in a single instance in passing the tube above the sigmoid, and in only two

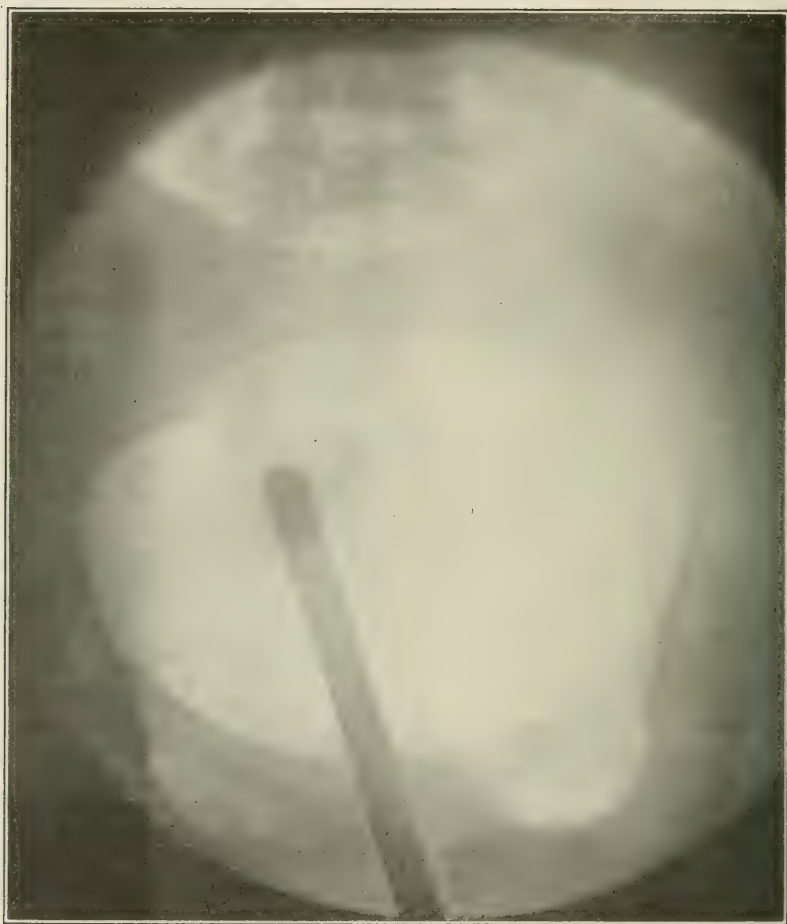


FIG. 3.—Patient No. 3. Skiagraph of stilet of horse catheter (coiled wire spring). Introduced with patient in dorsal position. Ventrodorsal.

of the skiagraphed results does the tube go beyond the ampulla of the rectum. Haires in his paper says that in one case he was able to pass the tube not only into the descending colon, but passed it through the splenic and hepatic flexures as well; this, however, being done by aid of a sigmoidoscope with the subject

placed in an inverted position, which has no real bearing in therapy since it is not practical.

When we consider the anatomy of the colon, sigmoid, and rectum, it is not to be wondered that these maneuvers have failed in their accomplishment. The rectum is well fixed at the lower portion; it immediately curves backward and the mid-portion follows the curve of the sacrum, then ascends obliquely to the left sacroiliac symphysis, to be continued as the sigmoid, having a



FIG. 4.—Patient No. 4. Stiff rubber rectal tube passed while patient was lying on right side and belly with legs partially drawn up.

more or less sphincter at this point, sometimes called the third sphincter. Thus we see that the rectum is not by any means a straight path, and the smaller caliber of the upper portion may and does act as an obstruction to the passage of foreign bodies coming from below.

Considering the anatomy of the sigmoid (Fig. 1), we find it first runs across the upper surface of the bladder to the right pelvic wall, then recrosses the pelvis in a line posterior to its first crossing; finally it returns toward the middle line, and passes into

the rectum. The upper portion of the rectum is mobile and the mesosigmoid unusually long and permitting freedom of movement. Undoubtedly, this last factor explains why many have been confident that stiff instruments have passed into the colon when in reality the viscus was pushed upward and the instrument did not follow the lumen at all. Therefore, when one considers the tortuous route of the lower bowel, its many angulations and places of obstruction, can we wonder that sel-

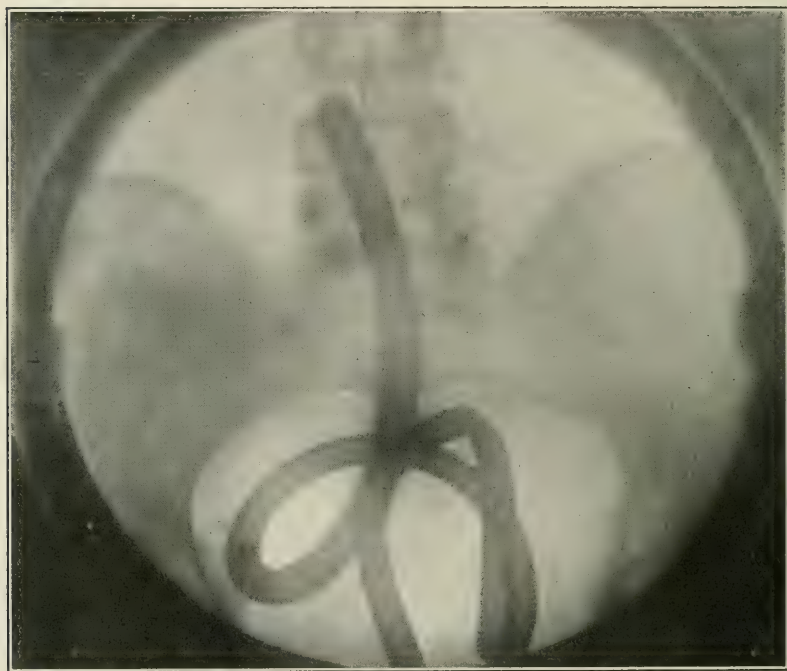


FIG. 5.—Patient No. 4. Lying on right side and belly with legs drawn up. Stiff rubber tube. Fourteen ounces of water in rectum.

dom, if ever, does the colon tube find its way to the colon, and when it does it is probably associated with Hirschsprung's disease or congenital dilatation and hypertrophy of the colon.

The sole purpose in attempting to pass the ordinary rectal tube into the colon has been to carry fluid directly to that viscus for the purposes of food absorption or ablution. I think we can substantiate by our skiagraphs that these premises are wrong, that it is unnecessary, unwise, and mischievous. Having concluded upon the uselessness of the colon tube, as such, we

became interested in how such good results could be obtained by Murphy's drop method of administering normal saline solutions, when he advises the tip of the instrument to be ad-

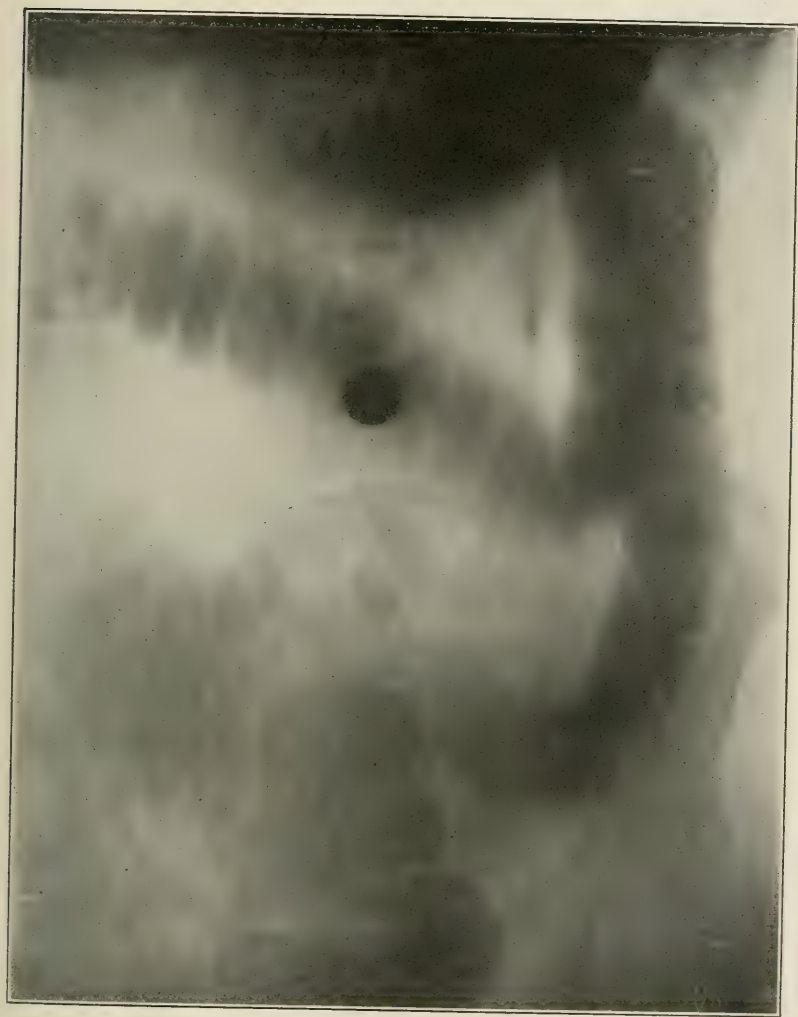


FIG. 6.—Patient No. 6. One quart bismuth mixture injected in Sims' position. Tube inserted 5 inches. Skiagraphed dorsoventral after twenty minutes.

mitted but a short distance, since many observers had thought that this absorption took place alone in the rectum and sigmoid. Now, while it is believed that these latter have a considerable power to absorb large quantities of water, it did not seem

rational that they alone could take up so much. The manner of absorption of foods into the body is not certainly known; many of the physical laws are necessary for this perfectly working



FIG. 7.--Patient S. A. One quart of bismuth mixture injected by ordinary rectal tube inserted 5 inches with patient in Fowler's position. Skiagraph in Fowler's position after ten minutes.

system, and yet physics alone will not satisfy for an explanation of this phenomenon(13).

Statements from those who are accepted as good authority are not in accord. We have those who maintain that water

injected into the rectum will never be carried higher. Others say we have no such thing in the normal gut as reversed peristalsis and, indeed, that absorption in the colon beyond the splenic



FIG. 8.—Patient 8. B. Eismuth mixture, 1 quart, injected into rectum while in Fowler's position. Position changed to horizontal after twelve minutes. Dorsoventral skiagraph.

fixture is but little. In view of the fact that under favorable circumstances the colon can absorb such enormous quantities of water, it does not seem tenable but that the entire colon is a very actively secreting surface and that the mucous membrane

of the larger bowel absorbs fluid with great rapidity when that portion of the gut is in its normal condition of moderate distention; overdistention of course would defeat this end. Antiperis-

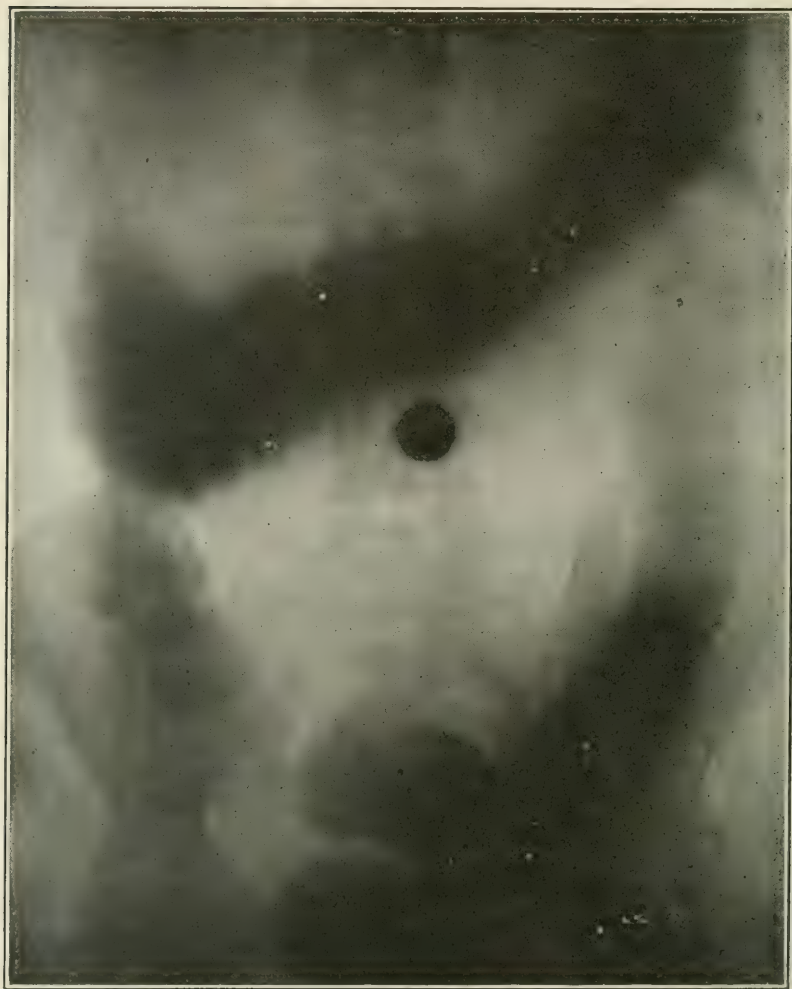


FIG. 9.—Patient 8. C. Bismuth mixture, 1 quart, injected into rectum while in Fowler's position and then changed to horizontal. Skiagraph thirty-five minutes after injection.

talsis was first discovered by C. Jacobi(14) in 1890, and later confirmed by W. B. Cannon(15), T. R. Elliot, and E. Barclay Smith. Is it not reasonable, therefore, to assume that the great absorptive ability on the part of the colon during proctoclysis

is made possible by this antiperistaltic wave, which is caused by the stimulation of a rectum distended by water and which has for its purpose the ability to carry part of this water upward and also to check the onward trend of the regular peristaltic wave from above, thereby keeping the water in contact with the mucous surface long enough to promote absorption? It does not seem reasonable that water injected into the rectum finds its way into the colon alone through pressure, as is maintained by Hertz(17).

I submit the following skiagraphs, first of all, to show that fluids injected into the rectum are carried to the cecum. Second, that no device is necessary for this end except a small male catheter. Third, that within ten minutes this fluid can be skiagraphed in the cecum. Some of these pictures are taken with patients in the dorsal position, some in ventral, and some in Fowler's. Bismuth carbonate 4 oz., mucilage acacia 8 oz., water q. s. to 1 qt., constituted the mixture used when specified on skiagraphs as bismuth mixture. The mixture was always injected by a small rectal tube or a large male catheter inserted 5 inches. If done slowly, no trouble was had in injecting 1 quart even in our smallest subjects.

OBSERVATIONS AND CONCLUSIONS.

1. Seldom, if ever, are soft-rubber tubes admitted into the normal colon.

2. When an endeavor is made to force the tube upward, even by the gentlest manipulations, it is found to coil itself up in the rectum and there do positive harm because of pressure, irritation, and the consequent inability to retain the enema.

3. In perhaps half the instances it is impossible to tell when the tube is coiling upon itself, even when we suspect it.

4. Colon tubes as such are of no value because they do not reach the colon, and they are mischievous in that proportion as we endeavor to force them higher up.

5. Water or fluid injected 4 or 5 inches into the rectum is carried upward into the colon and may be found at the cecum in ten minutes.

6. There is good reason to believe that a reversed peristalsis is set up when fluids are injected into the rectum.

7. The introduction of a tube more than 5 inches for colonic irrigation or therapeutic enemata is useless and likely to defeat the object desired.

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- 1360 FORT STREET.

DISCUSSION.

DR. LEWIS S. McMURTRY, of Louisville, said the paper was practical and presented for consideration very important points. In the after-treatment of abdominal operations the therapeutics of enemata and rectal irrigation had assumed very great importance. He presumed that the experience of every one was like his own—namely, they had satisfied themselves several years ago that they were practising a deception upon themselves by what was called high enemata, moving the bowels after the inhibition of the alimentary tract in a surgical procedure which involved opening the peritoneum. It was discovered that what were called high enemata were not high enemata; that if one introduced a soft tube into the bowel and kept on passing it it reached up to the sigmoid and then it began to coil on itself and it did not pass into the bowel as it appeared to do, so that years ago he abandoned all efforts at high enemata, recognizing that it was a deception. The sigmoid flexure played the same part in the pelvic basin as did the omentum in the abdomen. One might say that the sigmoid was the omentum, the policeman in the pelvic basin. It passed across, and in inflammatory conditions the sigmoid flexure was always found adherent just as the omentum was found higher up. This anatomical fact had a great deal to do with the subject that had been so forcibly presented by Dr. Yates, and that was the descending colon passed down closely, the mesentery was short, and one got the sigmoid with its very long mesentery, and then the rectum was

bound down closely so that the sigmoid anatomically had a large range of movement. It was known that the sigmoidoscope and tube used for examining the colon, as well as the colon tube for irrigation, had been frequently passed in and felt in the upper abdomen, leading one to think it was in the colon. When it went into the sigmoid and pressure was made the sigmoid would spread out like opening a fan, and it was found that the tube did not reach the colon at all, and physicians were practising a deception upon themselves with regard to colon irrigation and high enemata.

He had been interested in this subject in consequence of some investigations which were made along the line of Dr. Yates' paper by Dr. Hanes, of Louisville, who had shown, by means of skiagraphs, the things he had just spoken of and had demonstrated the fact that the tube did not pass up into the colon; that in the ordinary horizontal position fluids did not pass up there under any circumstances. We had now reached a point where we could demonstrate that we had been making errors for a long time in regard to high enemata. These facts had an important bearing on irrigation of the colon and its treatment, especially for ulcerative conditions.

DR. J. GARLAND SHERRILL, of Louisville, had seen some of the work done by Dr. Hanes along this line. In the fall of 1908 Dr. Hanes began to make his experiments and concluded after making a number of them with soft tubes and with bismuth that the tube was not ordinarily passed beyond the sigmoid. He used the proctoscope in one instance, both with bismuth and tube, with the patient in the inverted position, and concluded that he had passed the tube around to the cecum and so reported. Later, by other experiments he discovered he had not passed the tube beyond the sigmoid. This was proven by the position assumed by the tube when inserted into the cecum and pushed around in the cadaver to the sigmoid.

It would seem that in the sigmoid there was a great variation in the length of this tube. The fixed point on the left side held the lower colon, descending colon, and the sigmoid might assume almost any length in a given case. Dr. Hanes found on the cadaver in one instance a sigmoid that was 30 inches in length; in others it was as short as 10 inches. He introduced a straight tube, carried it above the navel, and thought it had passed into the colon when it did not. Dr. Hanes had demonstrated that fluids passed with difficulty into the colon and cecum because of the amount of gas that was found in this portion of the bowel, and if there was an opening in the cecum or appendix the gas would come out and the fluid would go in. Dr. Hanes used coal oil in the treatment of amebic dysentery. He found that water would absorb a certain amount of gas and if passed in slowly would mix and allow it to pass on clear to the cecum.

DR. LOUIS FRANK, of Louisville, stated that he had been

familiar with the original work which Dr. Hanes had done, and through it they had ceased for a number of years in attempting to introduce a tube high into the bowel, as it had been shown to be impossible.

As to the therapeutic value of injections into the bowel, he was perfectly familiar with the work of Dr. Hanes in this direction, and he desired to say that there was a distinct value in the injection of fluids for medication in lesions of the bowel high up by the use of the inverted posture, to which the essayist had alluded. It gave absolutely no pain or discomfort to the patient. He had had Dr. Hanes treat several cases of lesions of the bowel for him, particularly young girls and women, without any inconvenience or discomfort. The proctoscope was introduced above the upper valve and the fluid poured in. It was astonishing in this way what amount the bowel would retain. In cases of amebic dysentery and of ulceration of the bowel high up, as well as in certain catarrhal conditions, the injection of fluids or medicaments was of distinct advantage and could be carried out without the least discomfort to patients. As a therapeutic measure, it was of great value and accomplished results which could not be obtained in any other manner.

DR. FRANCIS REDER, of St. Louis, Missouri, said that Dr. Soper and he had done considerable work in the field of rectal inflation and the injection of water or fluids into the lower bowel, endeavoring to try to get up as high as possible. They had done this work in a hospital in which a great many physicians treated patients, and frequently these physicians would say to the nurses in certain cases: Give the patient a high enema or a colonic flushing. He had often wondered what improvement such men expected to get from these so-called high enemata.

The excellent skiagraphs that have been exhibited by Dr. Yates were really very conclusive, in that they showed from an anatomical and physiological standpoint that everything seemed to be against any fluid entering the bowel at any considerable height through a tube. Furthermore, one should not lose sight of the danger which might attend the introduction of various tubes into the bowel. If one took an ordinary colon tube and introduced it into the bowel it was impossible to get it above the promontory of the sacrum. So far as high flushings were concerned, by simply introducing his hand into the lower bowel he had convinced himself that the ordinary tube coiled up and fluids did not reach beyond what had been termed the shelf of the rectum. The introduction of instruments into the lower bowel required intelligent manipulation and skill, and it was not entirely free from danger.

DR. JOSEPH PRICE, of Philadelphia, pointed out that Senn's experiments with hydrogen gas had put all the boys in America with habits of industry to work in repeating his experiments with gunshot and stab wounds of the abdomen. With hydrogen gas Senn simply determined the presence or absence of lesions of

the bowel. He repeated these experiments after Senn had presented the results of his work to the American Medical Association, before the Pennsylvania State Medical Society, and met with severe criticism and ridicule.

A classmate of the speaker, Hyde Cooper, wrote a paper on large bowel alimentation, and received a one hundred dollar prize from the University of Pennsylvania in 1877. Cooper made very extensive experiments as far back as 1877. The experiments so beautifully alluded to by Dr. McMurtry were carefully made by some good army and navy surgeons in their efforts to relieve amebic dysentery, and they came to precisely the same conclusions that Dr. McMurtry did from his observations, and all of these men recognized that it was necessary to follow up scientific medication of the large bowel at some other point than that of the anus. In the army and navy hospitals there were a number of orderlies who had had their appendices removed and permanent fistulæ established for medication and they had improved rapidly. Their trouble had vanished and they had refused to have the fistulæ closed because they recognized the benefit of medication from that source.

DR. YATES, in closing, said, in dealing with the question of colonic lavage, he deemed it pertinent to bring this matter up to show that water did not pass the colon with the patient in a horizontal position. The purpose of the paper was not so much to show the possibility of passing the colonic tube high up as it was the possibility of medicating not only the rectum and sigmoid but colon with fluids, and unless the skiagraphs were entirely wrong he was able to show that this was possible. He could show from every direction that the tube or fluids passed the entire large bowel clear down to the cecum.

THE DIAGNOSIS OF THE CHRONIC SURGICAL LESIONS IN THE UPPER ABDOMEN.¹

BY

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THE differential diagnosis of chronic surgical lesions in the upper abdomen can be made with accuracy, in the great majority of instances, by the anamnesis alone. This differentiation can be strengthened frequently by the physical findings and later receive such confirmation as may be obtained from laboratory examinations. Do not construe this language as detracting from the value of laboratory findings in any way or to any degree, but, rather, as placing them in their proper subordinate

¹Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists held at Syracuse, September 20-22, 1910.

relation to the anamnesis. Diagnosis is the greatest thing in surgery after all, and the mastery of it is one of the qualifications which distinguish the true surgeon from the mere operator. Of all the methods in diagnosis, the anamnestic—the taking of the medical life history of the patient—is at once the most important and the most neglected.

Cholelithiasis and Ulcer.—Cholelithiasis and ulcer, especially duodenal ulcer, in their early stages particularly, present many of the same symptoms. As these symptoms are diagnostic in their nature, differentiation depends upon a correct interpretation of them as regards their character, location, severity, time of occurrence as related to the ingestion of food, and the periodicity of their recurrence. So slight is their variation in these respects in some instances that the diagnosis of cholelithiasis as opposed to ulcer is extremely difficult, while the differentiation of gastric from duodenal ulcer, infrequently impossible, is not attended, ordinarily, by such difficulties. Nevertheless, differentiation of cholelithiasis from ulcer can be accomplished, and with greater frequency and certainty, whenever due regard is given to the interpretation of the comparatively mild symptoms announcing the initial stage of both gallstone disease and ulcer. Much of the difficulty in diagnosis is attributable to either a lack of knowledge concerning the early or inaugural symptoms of both conditions or a failure in the appreciation of the diagnostic value of them.

That the symptomatology of gallstone disease, as generally understood and as taught in our text-books, is but the symptomatology of its terminal events or complications rather than of its initial phenomena is largely responsible for the many failures in the diagnosis of this common condition. Until there comes a general recognition and a due appreciation of the early symptoms of cholelithiasis and until colic, jaundice, bile-stained urine, and putty-colored stools universally are recognized as indicative only of its late complications will we continue to witness sudden and unexpected deaths from its many terminal events.

That considerable misunderstanding exists also as to what phenomena constitute the early symptoms of uncomplicated gastric and duodenal ulcer and that they have been confused with the more late and more striking symptoms of complicated ulcer is apparent to all who are conversant with the literature of the subject. This confusion seemingly is due to the fact that some observers, meeting with ulcer which has existed within the

stomach or duodenum in various stages of activity for a period of from five to twenty years, enumerate the striking and persistently continuous symptoms present after the lapse of those years as the symptoms of ulcer. They either ignore or fail to realize the fact that the symptoms present at that late period almost invariably are those of the complications of ulcer—the contractures of the stomach wall, the obstruction at the pylorus and its sequentially occurring conditions, the adhesion of the stomach or duodenum to contiguous structures, even in not a few instances the ingrafting of malignancy—rather than those correctly attributable to ulcer and to ulcer alone.

As in cholelithiasis there is an early period with its attendant initial symptoms so decisive that a diagnosis safely can be based thereon and a late complicated period with its well-known terminal symptoms, so in gastric and duodenal ulcer there is an early uncomplicated stage during which the pure symptoms of ulcer prevail, and a later complicated stage announced by symptoms more striking and more continuous than those of the early period, but which are the symptoms of the complications and not of the ulcer.

Since the diagnosis of cholelithiasis and of ulcer must rest largely upon the anamnesis, it is necessary that the latter be complete, exhaustive, and minute as regards every detail, and that all points therein be interpreted judiciously and accorded both their individual and collective value.

Gastric and Duodenal Ulcer.—When ulcer patients seek relief presenting the early symptoms of the disease, careful questioning will bring out the fact that these symptoms have existed periodically for at least months or, more often, years. If the patient can recall the events of the earliest history period, not infrequently he will affirm that only an immoderate meal then provoked an attack of stomach distress or pain. At a somewhat later period, the one hearty meal of the day was followed by pain, while the two lighter meals were not so attended. Still later, all three meals, if of the same consistency, equally provoked the distressing syndrome.

The fact that stomach symptoms of some nature have existed for a long period of itself should suggest the possibility of ulcer. That these symptoms have recurred in periodical attacks alternating with intervals of comfort and health emphasize not alone the possibility, but also the probability of ulcer. This periodicity is, in fact, the most striking feature in the

history of ulcer. The attacks recur at irregular intervals, with the symptoms appearing suddenly and continuing without change in character, time, or duration day after day, week after week, or month after month. Every day, every week, every month is but a repetition of the previous day, the previous week, the previous month. Suddenly, and from no apparent cause, comes an interval of complete, or nearly complete, relief from all symptoms, and for weeks, months, or even years the patient is supposedly well. If treatment was instituted during the attacks, such treatment is given the credit of a cure. Eventually, however, there comes a repetition of the attacks, the symptoms recurring with the same suddenness and possessing the same characteristics save that they are more pronounced and more nearly continuous.

Thus the cycle of alternating attack and interval of relief is completed and continues year after year until, as secondary phenomena complicate the primary disease, the attacks are of longer duration and greater severity, while the intervals grow shorter. Finally, there comes a time marked by the total absence of intervals of relief, when the symptom-complex, which has been changing gradually as the intervals have shortened, is far different from that attending the early periodical attacks and marks the late or complicated stage of ulcer.

The analysis of the symptoms manifest in these early attacks is best begun with the ingestion of food. As soon as food enters the stomach the patient experiences perfect ease, it matters not how severe may have been the stomach distress prior thereto. A small quantity of food assures ease as certainly as does a full meal, but the greater the proportion of solid food, the longer will be this period of ease. The duration of stomach ease, however, while influenced by the consistency of the food, somewhat depends on the situation of the ulcer and largely on the presence or the absence of adhesions.

In the initial stages of ulcer the stomach symptoms are so mild in nature and make so slight an impression on the patient that frequently it is difficult to secure a history of their occurrence. They are very like to the initial symptoms of cholelithiasis, but vary from them in the important particular of time of onset. In both ulcer and cholelithiasis these initial symptoms are a sense of weight, fulness, and oppression referred to the stomach. There is flatulence, and the expulsion of sour or bitter gas affords more or less relief. In ulcer, however, this

sensation of weight, fulness, and oppression follows a period of ease lasting for from one to two hours in gastric ulcer and from two to five hours in duodenal ulcer. In cholelithiasis there may be practically no period of ease, the stomach distress appearing before the meal is completed or within thirty minutes after its completion. In fact, I have seen this stomach distress so great before the completion of the meal that the patient would leave the table and provoke vomiting in an effort to secure relief. Somewhat later in the history of ulcer, these initial symptoms become more pronounced, but the period of ease still remains.

Following this variable period of ease comes a stormy symptom-complex, which reaches the height of its activity in from two to five hours after the taking of food. Burning pain and distress in the stomach rapidly increase in severity, to be somewhat ameliorated but not relieved by the eructation of sour gas and by the expulsion of mouthfuls of sour vomitus. No significance can be attached to the pain as regards its location or its character, but the time of its greatest activity—from two to five hours after a meal—is most significant. It is the pain of a partially empty stomach rather than of a full one, and can be relieved by the taking of food, of drink, or of alkalies. In fact, rather than to speak of the pain as following a meal, it is more correct to refer to it as preceding and as being relieved by the meal. The "hunger pain," as Moynihan so aptly has named it, of duodenal ulcer is best illustrated by the attacks coming on in the night and waking the patient from sleep shortly after midnight. This pain persistently destroys comfort and prevents sleep until food is taken, when comfort is restored and sleep becomes possible.

Tenderness on pressure at a fixed point in the epigastrium generally can be elicited in the early stage of ulcer during an attack of pain, and the location of this fixed tender point often is of value in ulcer localization. When this tender point is just to the right of the median line, it is indicative of ulcer at or near the pylorus. When some distance to the right, it has value in determining the existence of duodenal ulcer. The farther the tender point is to the left of the median line, the farther from the pylorus the gastric ulcer will be found. Referred pain and tenderness occasionally are noted in the back to the left of the spine and opposite the tenth and eleventh dorsal vertebræ in gastric ulcer, while the referred pain and tenderness in duodenal

ulcer radiate more to the right along the edge of the ribs, as in gall-tract disease.

Late in the history of ulcer, when the symptoms attending its complications overshadow those of the ulcer, the appetite, which previously has been good, becomes fickle and poor and, because of the intense stomach distress following every meal, many patients purposely deny themselves food. As a result of the poor appetite and of this denial, loss in weight and strength follow and, not infrequently, invalidism becomes pronounced. There is no longer either periodicity of attack or interval; for pain, or marked distress at least, occurs with every meal. Following the intake of food there is no ease as in the early days, but pain, which may show wide gradations from a more or less distressing soreness to a sharp stabbing sensation, occurs immediately. This pain always is located at the same point in the epigastrium, and generally steadily increases in severity until the stomach is emptied by irrigation, by forced vomiting, or by the escape of the stomach contents into the intestine. The relief which comes with the empty stomach is more frequently relative than absolute.

Contractures and the resulting distortions of the stomach wall, obstruction of the pylorus, subacute perforations, and adhesion of the stomach and duodenum to the surrounding structures, especially to the gall-bladder and the kidney pouch—all these produce symptoms modified and varied according to the nature of the complicating lesions.

Hemorrhage in gastric ulcer occasionally is an important, pronounced, and dangerous symptom. Occurring as a hematemesis, it is both more frequent and more voluminous than in duodenal ulcer. Hemorrhage in duodenal ulcer, occurring as either hematemesis or melena, ordinarily must be considered as a late result of the ulcerative process, occurring long after a diagnosis should have been established. While hemorrhage unquestionably occurs in the large proportion of the cases of duodenal ulcer, it is as an internal or concealed hemorrhage in many instances and, depending upon its severity or the frequency of its repetition, must be recognized by the general symptoms of hemorrhage or by the secondary anemia or by the presence of blood in the stools rather than by the vomiting of blood. In the differentiation of cholelithiasis from ulcer, the occurrence of hemorrhage necessarily must be considered as a confirmatory symptom of ulcer, either gastric or duodenal.

Cholelithiasis.—The initial symptoms of cholelithiasis, which invariably are referred to the stomach, may be fairly constant, recurring meal after meal and day after day, varying but slightly in character and intensity. In other instances they are noticeably present only after the ingestion of an unusually hearty meal or of some particular article of diet. In some patients the symptoms may be fairly permanent for weeks or months, to be followed, as are the painful attacks in early ulcer, by an interval of complete relief. In my own experience, in the majority of patients these symptoms have been marked by fluctuations in intensity rather than by intermissions in occurrence.

Following the ingestion of food there is no ease as in ulcer, but, either before the meal is completed or within thirty minutes after its completion, the patient is conscious of a feeling of fulness, of weight and oppression, an uneasiness, or a discomfort, invariably referred to the stomach. Occasionally distinct but transitory pain is present which, compared with the pain of early ulcer, is of much less intensity, occurs much sooner after the taking of food, in fact, is the pain of a full stomach and not of an empty one, and does not progressively increase and reach its height at from two to five hours after a meal. This pain in cholelithiasis not seldom radiates through the back in the direction of the right shoulder, which is in sharp contrast with the direction of the referred pain in gastric ulcer.

With the onset of pain, be it ever so slight, frequently comes a feeling of cold, a chilliness, never severe, never of long duration, and more often noticed in the evening than at any other time. Shortness of breath, manifest early in the course of a meal and increasing as the meal progresses, is a constant complaint of some patients. Moynihan has called attention to a catch in the breath—a sudden stabbing pain—which occurs on deep inspiration and which is characteristic of gall-bladder diseases, often distinguishing them from gastric and duodenal conditions. Occasionally patients will complain of a more or less constant discomfort—not a pain—originating at the site of the gall-bladder and extending to the right along the edge of the liver to the axillary line. In my experience, this discomfort bears no relation to the ingestion of food as does the similarly located referred pain occasionally present in duodenal ulcer.

Flatulence is associated with the pain, and when the patient belches she experiences some relief from the weight and oppression in the stomach. Following free eructation, the gastric

symptoms frequently disappear completely. Nausea may be present in some cases, and vomiting, although an infrequent event, may occur with complete relief from all stomach symptoms.

One of the most valuable signs of gallstone disease is tenderness over the gall-bladder, due to a low-grade cholecystitis, resulting from the presence of stone. Whenever this tenderness is not readily apparent, it may be elicited by insinuating the thumb well under the edge of the ribs, over the gall-bladder, and requesting the patient to take a deep inspiration. As the liver and gall-bladder are thus forced downward, the globe of the latter comes in rather close contact with the thumb, causing a sudden sharp pain and an immediate involuntary arrest of inspiration. This point of tenderness is still farther to the right of the median line than is that of duodenal ulcer.

Another sign of the existence of gallstones, infrequently met in my own experience, but of considerable value when present, is tenderness over the posterior surface of the liver, opposite and to the right of the eleventh and twelfth dorsal vertebræ. This sign sometimes is obtainable when deep thumb pressure over the gall-bladder is negative in result. This tender point is on the opposite side of the spine from the tender point in gastric ulcer.

Gallstones may remain quietly housed in the gall-bladder for years, practically producing no symptoms, save those above enumerated as the early or initial ones. The continuation of these mild symptoms over a long period indicates the existence of latent gallstones which, unfortunately and all too frequently, are latent only in so far as the production of striking symptoms is concerned. For months or for years these symptoms may continue without marked exacerbations; in fact, the majority of patients will not give during a lifetime more marked indications than these of the presence of gallstone disease. On the other hand, the irritation of calculi in the gall-bladder, determining an infection of that viscus; the entanglement of a stone in the pelvis of the gall-bladder or in the convolutions of the cystic duct; the transit of a stone through the common duct or its impaction therein; the secondary infection, suppuration, and perforation of the gall-bladder and the ducts; the pericholecystic and pericholangic inflammations with crippling adhesions; primary malignant disease in gall-bladder and duct; acute and chronic pancreatitis, with a possible incurable diabetes, are terminal events which, most unexpectedly and most rudely, may

disturb the quiet progress of these mild, unappreciated, and misinterpreted symptoms of latent gallstones.

To even enumerate the symptoms of these many terminal complications of cholelithiasis would carry us far afield beyond the necessary limitations of this paper. They are the symptoms so generally and so erroneously accepted as the only diagnostic evidences of gallstone disease, the chief of which are colic, jaundice, bile-stained urine, and putty-colored stools—symptoms which are inadequate in purpose, in so far as the prevention of complications and the conservation of health and life are concerned, in that they appear late in the disease and only after the initial and mild, but equally diagnostic symptoms have been present for months or years.

A more complete consideration of these late symptoms and complications of gallstone disease will be found in my paper, "The Terminal Events of Gallstone Disease," which I had the honor to present before the association last year.

Cancer of the Stomach.—In the great majority of instances (66 per cent., according to Moynihan, and 67 per cent., according to Mayo) cancer of the stomach is but a sequence of ulcer, the symptoms of the latter gradually merging into or being displaced by those of the former. These symptoms are those referred to above as denoting the existence of complicated ulcer. The period of stomach ease after food steadily shortens until there is no ease, for distress at least, if not actual pain, occurs immediately following the taking of food. Somewhat later in the disease, the pain is continuous in most instances. It generally is of moderate intensity, bearable but persistent, and is aggravated immediately by the ingestion of food. This pain, while more diffuse than the pain of ulcer, is still epigastric in its location and is not the widely diffuse pain of perforation. The appetite, which has been good during the ulcer stage or which later has been controlled because of the distress resulting from its gratification, may be annulled by an intolerable disgust for foods. This disgust is particularly noticeable as regards meats, and especially fat meats. Flatulence generally is present, and the eructation of gas, which at times may be extremely offensive, gives a short measure of comparative relief.

Vomiting may or may not be a dependable symptom in cancer. Its occurrence and its nature hinge largely upon the degree of obstruction to the onflow of stomach contents, and that

depends upon the location of the growth. In cancer imbedded on a pyloric ulcer base, the vomiting, which may have been a marked symptom during the ulcer period, becomes more prominent and more persistent. It is obstructive in nature, urgent and copious. The vomitus frequently consists of long retained food and may be intolerably offensive. There may be but a show of blood in the vomitus or a decided hematemesis may occur.

In cancer located away from the pylorus, generally along the lesser curvature, while there may be no actual mechanical obstruction to the passage of food, there will be some interference therewith. This interference, in many instances, however, will not produce vomiting. The symptoms in prepyloric cancer are constitutional, save for the exception of pain, tenderness, and tumor.

Anemia is the most striking of all the symptoms, both local and general, of gastric cancer. It is a continuously progressive symptom, frequently showing more markedly in the face than elsewhere. Especially is its pallor noticeable about the eyes, nose, and mouth. The anemia is occasioned by a more or less continuous loss of blood, which may not be manifested by vomiting, but can be determined by tubage or by examination of the stools. The skin is pale, dry, harsh, and wrinkled, and here again is the condition especially noticeable in the face. There is progressive loss of both weight and strength. Languor and indifference become noticeable, and the face shows an accepted, calm, and hopeless resignation.

Cancer sequent upon ulcer may occur after a long typical history of ulcer with its periodical attacks and intervals of latency; or after a few attacks followed by a long interval of repose; or, seemingly, with a complete absence of a precancerous stage, in which the first attack or first illness is the fatal one, in which the ulcer apparently takes on malignancy practically at its very inception. The more this latter class is studied; the more minutely and persistently we delve into the history of preceding years; the more critically we observe and analyze the conditions disclosed on the operating-table, the more strongly the conclusion is forced upon us that at some time, remote it may be, there have been present the symptoms of ulcer—symptoms which, in passing, either did not particularly impress the patient or did not receive their correct interpretation. Ulcer may remain latent for months or years, pro-

ducing practically no symptoms. Such a latent ulcer without the least warning may cause the acute surgical disasters of hemorrhage or perforation. Further, such an ulcer may undergo malignant changes and, save for waning strength and wasting flesh, produce no determining symptoms until comes profuse hemorrhage, obstruction, or palpable tumor.

Cancer developing on a latent ulcer may be most rapid in its course. In these cases the symptoms appear suddenly while the patient has every reason to believe that, in so far as his stomach at least is concerned, he is in perfect health. Frequently the first symptom is a hematemesis, which may be decidedly profuse. The sudden anemia resulting therefrom not only remains, but also progressively becomes more apparent. Vomiting, with or without blood, may or may not recur. The stomach distress or pain is fairly continuous but variable in intensity. Loss of appetite or a disgust for foods, especially meats, quickly is evident. A palpable tumor is demonstrable early. Strength and flesh rapidly and steadily are lost and death soon closes the scene.

Chronic Pancreatitis.—As practically 80 per cent. of the cases of chronic pancreatitis are terminal events in gallstone disease, the diagnosis of the former will be facilitated greatly by the recognition and correct interpretation of the early and slight symptoms of the causal and concurrent infection of the biliary tract. Of the symptoms directly attributable to the pancreatic disease itself, the subjective digestive disturbances generally are overshadowed by those of the associated gall-tract disease and are too indefinite to be of diagnostic value. The valuable symptoms resulting from faulty digestion are found in the altered condition of the feces. The evacuations are frequent, soft, bulky, and pale, and because of their frequency are often erroneously described by the patient as diarrheic. The frequency of the evacuations is due to their increased bulk, which is caused by incomplete digestion, especially of albuminous foods. The normal pigmentation of the feces being due to the presence of an insoluble pigment resulting from the action of the pancreatic juice upon some of the coloring matters of the bile, it necessarily follows that absence from the bowel of either pancreatic juice or bile will result in unpigmented feces.

A microscopical examination of the feces frequently will show the presence of an unusual and decided quantity of undigested muscle fibers, which, while a valuable indication of pancreatic

inflammation, is more strongly suggestive of malignant disease of that organ. Fat in the feces is a more reliable symptom of pancreatitis than is the presence of muscle fibers. Occasionally the feces are visibly greasy, but ordinarily a chemical examination will be necessary positively to determine, not alone the presence of fat, but, as well, the form in which it exists. Stercobilin, normally present in the feces, is diminished considerably in quantity in pancreatitis and absent or showing but the slightest trace in cancer of the pancreas.

Cambridge maintains that his test will give a positive reaction in practically all cases of pancreatitis and in about 25 per cent. of the cases of cancer of the pancreas, owing to a zone of pancreatic inflammation surrounding the malignant area. The absence of stercobilin from the feces with a positive Cambridge reaction is urged strongly as indicative of cancer. In my own experience, the findings of Cambridge's reaction have been verified almost invariably by the conditions found upon operation and, consequently, I have held it to be a procedure giving reliable information as to the condition of the pancreas. However, as competent laboratory experts and surgeons recently have pronounced this test to be absolutely worthless, it will be advisable, for the present at least, to rest the diagnosis in pancreatic disease upon the anamnestic and physical examinations of the patient and the microscopical examination of the feces.

Loss in weight, frequently referred to as a striking symptom in gallstone disease, is more often the result of the digestive inefficiency and the metabolic disturbances accompanying a pancreatitis secondary to the cholelithiasis. Occurring in connection with the symptoms of gallstones, it should be considered as a marked indication of a complicating pancreatitis. Jaundice appearing in the course of a chronic pancreatitis may result from either one of two different conditions, in each of which it will show certain distinct characteristics. If a gallstone occupying the distal portion of the common duct has caused a pancreatitis by obstruction and infection of the pancreatic duct, it may cause also, synchronously but independently, by obstruction of the common duct, a jaundice which will be characterized by the remissions attending the jaundice of common duct stone. If, on the other hand, the jaundice results, not directly from the common duct stone, but from the compression of the common duct by the swollen head of the inflamed pancreas, then the

jaundice remains constant save for the very gradual changes attending the progress of the pancreatitis.

In cancer of the head of the pancreas the gall-bladder is dilated, while in chronic pancreatitis it may be dilated or contracted. If gallstones and their associated infections long have preceded the pancreatitis, the calculous cholecystitis will have caused a sclerosis and contraction of the gall-bladder in many instances. The pressure of the accumulated bile and mucus behind the obstruction caused by the swollen head of the pancreas, will not be sufficient to distend the thickened walls of the sclerosed gall-bladder. On the other hand, if gallstones have not been present or if they have been present but for a short and uneventful period or if they have not caused crippling lesions of the gall-bladder, then the latter will be dilated.

The occurrence of hemorrhage following slight trauma or inconsequential disease occasionally is a striking feature in pancreatic inflammations and is due to the decided urinary elimination of the lime salts of the blood resulting therefrom. Hemorrhages into the skin, giving the appearance of severe contusions, are of frequent occurrence. The slightest bruising of the skin will be followed by the most decided discoloration. Several of my patients have given a history of profuse and prolonged menstrual periods occurring subsequent to other symptoms marking the onset of a pancreatitis. While other observers must have noticed this disturbance of the menstrual function, I have not been able to find the least reference thereto in the literature of the subject. A number of instances of severe, even fatal, hemorrhages from various abdominal structures apart from the pancreas are a matter of record.

Pain and tenderness, while generally present, are most variable in their intensity and, in some instances, may be absent entirely. Frequently it is impossible to determine whether these symptoms are caused by a pancreatitis or by the associated gallstone disease. Several of my patients when asked to point out the seat of pain, have outlined accurately the location of the pancreas from the concavity of the duodenum to the spleen. The fact that the pain of gastric ulcer may assume this same location and direction must not be ignored. Tenderness is elicited by pressure over the head of the pancreas, from 1 inch to 2 inches above the umbilicus and to the right of the median line. A slight rigidity of the rectus muscle is more often appreciable than is a distinct swelling in the head of the pancreas, although

this swelling can be outlined in many instances. In decided gastroptosis this tenderness of the pancreas frequently is pronounced in the absence of pancreatic inflammation.

Movable Kidney.—As pointed out by Longyear, movable kidney is associated with a prolapsed colon, and the symptoms of one are blended with those of the other. Pain, in a variable degree, is the prominent symptom of movable kidney. Only in a small proportion of the cases are the distinctive attacks known as "Dietl's crises" present. They are sudden in onset, marked by excruciating abdominal pain, attended by nausea and vomiting, followed by the weak and rapid pulse and the cold and leaky skin of collapse, with distended abdomen and the flexed knees and thighs of peritoneal infection. The kidney during the attack is extremely tender and generally is enlarged, pressure thereon causing not only pain, but also nausea and faintness. Jaundice sometimes is present, and the swollen and tender kidney may be mistaken for an inflamed and distended gall-bladder. Or, in some instances, the distressing syndrome may be interpreted as indicating an appendicitis or a ruptured gall-bladder. The pain of these crises might be mistaken in some cases for renal colic, but, as pointed out by Watson and Cunningham, it differs from that pain in that usually it does not radiate along the course of the ureter into the groin.

In some instances the cessation of the pain is as sudden as was its onset, while in others there is a more prolonged and gradual subsidence. One of my patients through a period of years had innumerable attacks of Dietl's crises which, invariably and immediately could be relieved by replacement of the wandering kidney.

Ordinarily a movable kidney gives rise not so much to actual pain as to a sensation of dragging and weight in the upper abdomen and loin. This discomfort is increased by the erect posture and diminished or abolished by the recumbent posture. During the attacks of pain there may be a burning distress in the stomach, which is uninfluenced by the ingestion of food and which persists for days. Nausea may be present, and occasionally vomiting may occur. Disturbances in urination are quite common, and with the occurrence of Dietl's crises may assume dangerous proportions. A certain, frequently a decided, degree of neurasthenia is present in the great majority of the cases of movable kidney which are productive of symptoms. Constipation or

alternating constipation and diarrhea is the rule in movable kidney.

The differentiation of an enlarged gall-bladder from a movable kidney can be accomplished by the physical examination. An enlarged gall-bladder, if movable, is so only from side to side, save for the slight ascent and descent incident to respiration, and seems to swing from under the edge of the ribs, while a movable kidney is movable from above downward and in the reverse direction; a gall-bladder points from the tip of the ninth or tenth rib downward and inward toward a point at, or 1 inch below, the umbilicus, while a kidney is displaced downward and outward; a gall-bladder, when small, is somewhat pear-shaped with something of a neck or depression between it and the liver, but when large appears as a globular tumor intimately connected with the liver, with neither neck nor depression, while the kidney has a shape and feel peculiarly its own; a distended gall-bladder lies near the surface, while a kidney is more deeply situated and passes upward, inward, and deeply backward when replaced.

Appendiceal Mimicry.—In conclusion, I need but remind you that the appendix so successfully may mimic many of the surgical lesions in the upper abdomen as to trick one, careless in his anamnesis, into an unwarranted upper abdominal exploration.

234 MICHIGAN STREET.

DISCUSSION.

DR. ROBERT T. MORRIS, of New York, arose to simplify one or two points. We could not always make an accurate diagnosis of the presence of gallstones. We should not fall into the trap of speaking of gallstones. It was a dangerous thing to do. Gallstones were merely incidental to cholecystitis. If the surgeon was sure that he could find them well and good, but if he did not he should not put himself in the position of saying that he expected to find them. One should speak of cholecystitis and not of gallstones. In about one-fourth of all gallstone cases operated upon in this country gallstones were not found. The patients had not only improved, but recovered from all their symptoms, the surgeon having simply to deal with cholecystitis, separating the adhesions and the symptoms disappearing.

DR. JOSEPH PRICE, of Philadelphia, agreed with Dr. Morris in regard to the nomenclature. In a number of neglected cases of appendicitis, the cold storage cases, and those that had been rubbed by osteopaths for a week or so, the old nomenclature of appendicitis fitted beautifully. One could easily call it cecitis, typhlitis, perityphlitis, enterocolitis, or wet or dry gripes. In these cases it was an easy matter to pick up the cecum and ileum

and they would part like wet blotting-paper. Such conditions were common. The clinician could only be educated to sent these cases to the surgeon early by witnessing these operations and seeing the pathological conditions that were found. Gallstone disease was very common, but neglected. It was common to find the gall-bladder and surrounding structures all fused together and disorganized. Abscesses and suppuration in the region of the gall-bladder were common. Quite recently he had had seven successive cases of suppuration of the gall-bladder and had found gallstones and a variety of filth at that point. More people were dying from obstructions due to neglected pathological postoperative lesions than from well-done operations.

DR. ROLAND E. SKEEL, of Cleveland, Ohio, said: If one secured so complete and certain a history as was necessary to make these diagnoses, then unusually intelligent patients must be met with. He did not think there was any possibility of getting the average patient, who was carefully questioned, to give such a complete and accurate history as to lead to a diagnosis typical of the conditions that Dr. Smith had so graphically described.

DR. SMITH, in closing, said the suggestions of Dr. Morris were good as regards the naming of conditions before operating on patients. It had long been his custom to explain to patients that he was operating for inflammatory conditions of the gall tract, which really caused the symptoms rather than for gallstones. If gallstones were found the surgeon was very much ahead in the game.

As to the question of the diagnosis between gallstones and cancer, in a number of recent cases, five especially, that occurred in his practice he had been led by the results to feel that he was almost ready to operate on every case of cancer about the gall tract and even to operate on suspicious cases by exploring them. He had been led to do this because of five recent cases, in all of which he even more than suspected cancer. He found two that were cancer, which were necessarily left alone, and three which were not. In these three the gall-bladders were full of gallstones, with adhesions of the duodenum on one side, with the colon piled up on the other, with a great mass there which gave the impression to the examining hand of cancer of the gall-bladder. The obstructive symptoms from the adhesions were quite similar to those obtained in certain cases of cancer of the biliary tract, and yet these three out of five cases were relieved by section temporarily, if not permanently.

PROBLEMS IN UTERINE CANCER.¹

BY

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THE problems of uterine cancer are so numerous that it would be impossible in the limits given to this paper to discuss them all. There are three of surpassing importance, upon which I shall not dwell, one as to its etiology, the second as to its antidote, and third, its pathology. It is a source of profound gratification that investigation is being carried forward along these lines by those eminently fitted for the task. Whether or not the cause will be discovered remains to be seen, but it is devoutly hoped their investigation will lead to the discovery of an antidote.

It was my privilege five years ago to present to this body a paper on the palliative treatment of uterine cancer. Since that time I have read papers before various medical societies, and contributed others to the medical press on the same general topic. I have no apology to offer for again bringing to the notice of this distinguished body the same problems and the same arguments, believing as I do that there are none of greater importance to engross professional thought, or which from the humanitarian standpoint, and that of preventive medicine, have greater claims to public sympathy.

For convenience of comparison the members of the medical profession may be divided into three classes: 1. That great class who make no serious effort at early diagnosis, whose patients drift on to the stage of hopeless interference and in which no rational effort save the administration of opiates and the vaginal douche is made for their relief.

2. A small class who make a diagnosis at an earlier period, not early enough as a rule for radical operation, who are so convinced that uterine cancer is absolutely or practically incurable that they put them in the "inoperable list," doing

¹Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists held at Syracuse, September 20-22, 1910.

little or nothing in a practical way for their palliation, and their patients join the helpless throng of unfortunates.

3. The slowly increasing few practitioners who use every endeavor for early diagnosis, who save some by early radical operation, who regard no case as necessarily "inoperable" for palliative purposes save in the final stage, and who adopt the best recognized method of palliative treatment.

The underlying reasons why the medical profession should be thoroughly awake to the necessities of the situation, are so plain that nothing but wilful neglect can discourage or obscure their preeminent importance. The frequency, the suffering, and the mortality attending uterine cancer are, or should be, of themselves sufficient argument why professional sentiment should be alert to this question.

First, as to its frequency: statistics show (and whether they are absolutely accurate is immaterial) that one woman out of every fourteen dies of cancer, and that after the age of thirty-five, the mortality rises to one in nine. Second, as to suffering, which is always present in cancer (it is no less so in uterine cancer) and is one of the most melancholy pictures possible to contemplate. The mortality is large, almost commensurate with the entire number of cases. The aggregate number of fatalities is difficult to ascertain, for the reason that boards of health do not require notification of its presence, and the further reason that the cause of death is not always properly given in death certificates.

Enough is known to appeal to the professional mind, the knowledge of which should serve as a stimulant to endeavor along the lines of preventive medicine, though preventive medicine in cancer has a very limited practical application save in uterine cancer, and then chiefly in cervical involvement. The traumatism incident to parturition is a factor in uterine malignancy which cannot be ignored. Failure to repair cervical lacerations is responsible for an undetermined but large percentage of these cases, and until this subject is universally understood and the remedy applied, the unavoidable consequences must follow. Pertinent to this is the following case of a woman from Mobile, Alabama, for whom I repaired the cervix in 1888. In September of this year she comes to me suffering from cancer of the uterine body—with a cervix of normal appearance. The comparatively few cases of uterine cancer in nulliparous women has a most important bearing on this subject. There

is a growing belief that cancer is contagious and infectious under certain conditions and this is entitled to its full measure of influence. Whether cancer is or is not of parasitic origin is undetermined, other theories having their advocates and believers. The frequency of cancer in certain families is suggestive that heredity is a factor in some cases, but accurate knowledge as to its cause will alone determine whether it is congenital or acquired. Coley, whose large experience entitles his opinion to much weight claims that after operative interference the use of the mixed serums of erysipelas and prodigiousus has some inhibitive influence on its recurrence.

The first and greatest impediment from the professional standpoint is lack of appreciation on the part of many, far too many, physicians to the imperative necessity of early diagnosis. The apathy and unconcern in some quarters is simply astounding. Every general practitioner should be awake to the necessity of early and accurate differentiation from other ailments peculiar to women which at the outset have symptoms in common with it. I cannot dwell on the subject of diagnosis, but the full clinical picture is not necessary to establish the presence of uterine cancer; neither does absence of pain make impossible its presence. Purulent vaginal discharge, so-called irregular menstruation, the various menorrhagias and other symptoms appearing during or subsequent to the menstrual period, due to the traumatism incident to parturition, or to other causes, demand and are entitled to prompt differentiation as to benignancy or malignancy. Between the hesitancy of women with such symptoms, who fail to seek advice either from undue delicacy, or ignorance of their meaning, and the indifference or inability to make a diagnosis is a terrible hiatus, and relief can only come when the chasm is closed. I would get near the heart and conscience of every practitioner of medicine in my appeal for him to do something, and that at once in arriving at safe conclusions.

Every physician owes it, not less to himself than to his patients, to calmly consider the interests involved. The safety of the patient may, and often does, bear a close relation to early and accurate diagnosis. The proposition is too axiomatic to claim further discussion. It is useless to ignore the difficulties involved in such a differentiation. If the attendant is in doubt, why not give the patient the benefit of one familiar and skilled in such work? There would be no hesitation on the part of

general practitioners to seek the advice of skilled specialists in grave surgical emergencies, as seen in serious involvement of the eye, in obscure abdominal disease, or in dangerous lesions involving the brain. Why then in these cases temporize or delay? Until the rank and file of the medical profession are ready and willing to give these cases the best skill at their command, the mortality of uterine cancer will not materially diminish.

The time is ripe when all individual practitioners, state and county medical societies, and organizations like this, should act singly and collectively to impress on the medical profession and all women the imperative need of such action.

This feature of the subject I will allude to later on, I desire briefly to discuss the treatment of uterine cancer, which should be radical or palliative, according to the stage of the disease. That there may be no doubt as to my attitude on this subject, I desire to state in unequivocal terms my belief that early extirpation of the uterus, in our present state of knowledge, offers the best chance of cure. If in cervical cancer there is any considerable involvement of the vaginal structure, primary hysterectomy cannot be undertaken. In these cases the first indication is high amputation of the cervix, and removal of the vaginal involvement. If healing follows, it will be the function of the attendant to decide whether it is better to do hysterectomy or to keep the case under close observation. If healing of the vaginal surface is complete, but the uterine stump does not heal, hysterectomy may and usually should be undertaken, providing there is normal mobility of the uterine body. I have done abdominal hysterectomy in such cases as a secondary operation—several patients being alive at this time after a period of from eight to nine years. One of these cases which I reported as cured, and had lost sight of for a period of more than six years, came to me in July seeking relief from cystocele and rectocele, with no evidence of cancerous disease. When high cervical amputation has taken place the difficulties attending subsequent vaginal hysterectomy are such as to make it difficult if not impracticable.

In case of primary cancer of the uterine body the problem of hysterectomy will hinge largely on the presence or absence of periuterine involvement. Fixation of the uterus, if not dependent on other coexisting causes, contraindicates hysterectomy. It is most desirable under such conditions that accurate differentiation be made. Full anesthesia with the hand in the rectum will best facilitate arriving at a safe conclusion. If the parame-

tria are involved, radical measures are contraindicated, but no one would assume to make an absolute diagnosis as to slight involvement of the lymphatics in the parametria. That belongs to the domain of microscopical research. Infection of uterine structure makes possible more or less remote secondary deposits not distinguishable by bi-manual palpation. The balance of sound judgment, practical experience, and the accepted pathologic development must be our guide in matters of operative interference. When, subsequent to the removal of the cervix and the vaginal growth, hysterectomy is expedient, the abdominal route should be chosen; first, because vaginal hysterectomy is neither easy nor practicable; second, as little interference as possible should be made with the remaining cicatrix.

The proposition to do hysterectomy for cancer of the body as a secondary operation is, I am persuaded, a matter which the average practitioner and many operators will not entertain, as being contrary to accepted theories; but, tested by practical experience in a certain class of cases, its value cannot be gainsaid. It is for this reason that I appeal to every such man to cultivate a tolerant spirit and not be too ready to condemn a step which is not in harmony with his preconceived opinion. If such men were to analyze the basis of their attitude, they would probably discover that it rested in absolute unbelief of the curability of uterine malignancy or of effective palliative treatment, and a prejudice so strong as forbids them to consider a revision of opinion of the efficiency of either radical or palliative treatment of uterine cancer.

The palliative treatment most in vogue consists of the application of potent escharotics, as arsenical paste, caustic potash, etc. The objection to their use is twofold; first, inability to limit the area of their destructive influence, and second, the violent pain attending their application. As a palliative measure the remedy par excellence is the thermo-cautery. In well equipped hospitals the electric cautery leaves nothing to be desired. The difficulty of keeping in order a portable electric-cautery apparatus often makes the Pacquelin cautery the method to be adopted. I have done more cautery operations with the Pacquelin than the electric method for reasons above suggested; but with properly selected accessories, I do not believe as some have claimed that the difference in effectiveness is vital. When one is reduced to the necessity of using a Pacquelin it is hazardous for obvious reasons to attempt the operation with a single apparatus. In either

case a variety of straight and curved platinum knives and dome-shaped instruments are needful. Tact in protecting the vaginal structures from undue heat, and skill with experience in removing all diseased structures compatible with the anatomical relations of the healthy and diseased structure is needful to the best results. It is important to keep in mind the possibility of doing conservative work by the thermic method, when there is primary involvement of the uterine body, as well as when it is secondary to high cervical amputation, even in periuterine involvement.

By the tactful and judicious use of platinum instruments it is possible in a greater or less number of cases to remove all of the uterine body, save little more than a shell of the uterus and its peritoneal covering, thereby prolonging the life and materially lessening the suffering of the patient. A burn penetrating through the peritoneum is unimportant if it does not involve the ureter, the intestines, the bladder, or bloodvessels.

While I have never had occasion to open the abdomen for the purpose of observing how far it was safe to push the intrauterine application of the cautery, I see no contraindication that it might not be done with safety and advantage. Any desiring more specific direction as to the technic of the operation are referred to my article entitled, "The Rational Treatment of so-called Inoperable Uterine Cancer," appearing in the April number of "The International Journal of Surgery."

In this connection its value as attested by the experience of the late Dr. John Byrne of Brooklyn, which I referred to in my paper five years ago, is most instructive and gratifying. Out of nearly 400 electrocautery palliative operations—not selected cases—about 20 per cent. of his cases were alive after five years. In my own experience the results have been no less satisfactory, though in no instance was any hope held out for recovery. Other palliative measures having value and entitled to careful consideration are the Roentgen ray and radium. My experience with radium is insufficient to enable me to speak authoritatively as to its value. So far, the most I can say is that it seems to act in some degree in favorably influencing better granulation, and to apparently diminish the tendency to bleeding. Two unsolved problems in the use of the thermocautery are the inhibitive influence it may have on cancer cells considerably beyond the area of actual destruction of tissue, and also the power of nature to replace structures which have been devital-

ized by heat through lymphatic absorptions and deposit of organizable deposits.

I use the above terms "unsolved problems" in their technical sense because, when considered from the clinical aspect, by the results following I am persuaded that it does happen, and on no other hypothesis can the effectiveness of the thermocautery be explained.

The unwillingness of those who decline to test its power and refuse to accept the experience of those who have is a matter of profound regret.

An article on radium, appearing in "The Journal of American Association," for July 9, by Dr. Robert Abbe, of New York City, whose opinion is entitled to weight, gives little hope of its utility save in cutaneous cancer. So also the x -ray has in my experience produced no cures. Perhaps the most that can be said is that it may exert a temporary modifying influence.

At this time, while study and research into the etiology of malignant disease gives hope that the antidote will soon be found, our principal efforts for the radical and palliative of this most distressing malady, are confined to hysterectomy and the employment of the thermocautery.

While progress is slow in the adoption of the thermocautery as a palliative measure, it is nevertheless apparent. Abroad and at home there is a growing appreciation of Byrnes' method. This was apparent at a meeting of The Section of Obstetrics and Gynecology at the Atlantic City meeting of the American Medical Association in June, 1909. In the discussion of two papers on "The Palliative Treatment of Uterine Cancer," written independent of each other, read by Dr. Boldt, of New York City, and myself, in the outspoken attitude of Kelly-Frederick, Polak, Wetherel, and others.

Frederick's article before the Section of Obstetrics and Gynecology of the June meeting of the American Medical Association was a masterly argument for early diagnosis and the effectiveness of the thermocautery as a "palliative" measure. His experience confirms the experience of others that cure in some cases has followed the thermic treatment even when altogether unexpected. No doubt the recovery was more frequent in squamous-celled involvement of the cervix than in adenocarcinoma. Ries speaks with satisfaction of the power of thermocautery and acetone as a palliative measure in cervical carcinoma

but records no cures. The experience of Keene, McNaughton, and McEvitt confirm the observation of Dr. Byrne.

As justifying conservative work in unpropitious circumstances, I desire to record the following: Two and a half years ago I saw with a well-known up-state surgeon a case of cervical carcinoma, involving not only the cervix but a portion of the vagina anteriorly, and extending over the urethra, which was just commencing to break down. I advised an immediate thermocautery operation which was rejected. Just after the patient (aged about forty-five) then cachectic, was seen by one of the most eminent metropolitan professors of gynecology and one of my confrères of the Long Island College Hospital. The metropolitan representative advised against interference, but the other gentleman did a thermic operation, with the result that healing took place and at the end of two years she had enjoyed good health, though about that time there was some return of the growth, and I have lost track of the case.

The thermocautery treatment is applicable to all stages of cervical cancer, and most cases of uterine involvement, save in the final stage. The *modus operandi* seems to be, first, its power to destroy or inhibit specific germs beyond the area of actual destruction of tissue; second, by closing the lymphatics, thereby limiting septic absorption; third, promoting healing, diminishing hemorrhage and purulent discharge; fourth, when the destruction of malignant growth extends to normal structure, the advent of healthy cicatrization; fifth, that by following the use of the cautery by daily gentle irrigation with one of the creasol compounds of not more than 1 dram to a quart, or a weak solution of permanganate of potassium (always avoiding the peroxide of hydrogen which is irritating and likely to provoke hemorrhage), and the daily dressing by oxid-zinc gauze, the suffering is greatly lessened and sometimes almost wanting until the unavoidable termination comes; sixth, that occasional well-authenticated cures have followed this treatment, in which no expectation of cure was suggested. These dressings should be undertaken with the utmost gentleness, usually with the patient in the Sims position, and the employment of a Sims speculum, thereby avoiding as far as possible all pressure on diseased surfaces.

While this treatment demands the expenditure of much time and labor on the part of the attendant, I have demonstrated to my entire satisfaction that no other known method of treatment can contribute so much to the comfort of the patient. In view

of these facts the hope is reiterated that many practitioners who have become disheartened and disappointed in every palliative measure will adopt and faithfully test the merits of this treatment. It should be added, in this connection, that when properly applied so that burning of healthy vaginal and vaginocutaneous surface is avoided, there is usually little or no pain following its use. And there is also no reason *per se* why this treatment may not be repeated whenever indicated.

Apart from the need of activity and discrimination among medical men, there remain two other problems of commanding importance. First, that such knowledge should be disseminated among women as will lead them to seek early advice under conditions such as have been enumerated. This involves on their part such an appreciation of the necessities of the situation as will enable them to escape the promptings of a mistaken modesty, that they may know and that early, whether their ailments are benign or malignant. Second, that public interest should be awakened among philanthropic men and women as has been for those suffering from tuberculosis, which will provide in every populous community, or every considerable area of sparsely settled territory, facilities for the care of the numerous cases of uterine cancer, the possessor of which, if without financial resources that will bring them skilled medical and surgical treatment and efficient nursing. Everywhere the facilities for the care of incurables are only too apparent, but in this disease, the most painful and loathsome, of which multitudes of women are hopeless victims, the demands of our common humanity require provision should be made for their comfort and relief. Without doubt, if the terrible suffering of this most unfortunate class were known and appreciated, swift relief would be forthcoming.

At the meeting of the Section of Obstetrics and Gynecology, American Medical Association in 1909 already referred to, the feature of preventive medicine came up under the discussion of the papers on the palliative treatment of uterine cancer read by Dr. Boldt and myself, but no action was taken.

At the annual meeting of the Medical Society of the State of New York, held in January, 1910, I offered a resolution calling for the appointment of a committee to consider and report to the society on these questions. It was referred to the council of the Society, but as yet I have been unable to secure their favorable action. This resolution, purposely, did not touch the question

of investigation of the etiology of cancer, which is being pursued in New York State, in New York City and Buffalo, as well as at other points, by those whose qualifications command the confidence of the medical profession, and inspire the hope that the cause and antidote of cancer will soon be known. If the medical society of the State of New York would exert the full measure of its influence to impress on every practitioner in the State of New York the necessity of early accurate diagnosis in these cases, and the reasons why the public should be interested in caring for the needs of this unfortunate class, it would give the movement an impetus which is bound to come with or independent of their action.

It is painfully evident that the professional mind is not yet sufficiently awake to the necessities of the situation to undertake the exercise of the prerogative which naturally falls within its legitimate province, the exercise of which will mark a new era in the philanthropic work of a philanthropic profession. It must be equally evident to every practitioner whose duties bring to his observation this class of cases, that a campaign of education within and without the medical profession is needful to a proper appreciation of this work.

It is my desire and hope on this occasion that this society will consider in a practical way these questions. To this end I invoke the mature judgment, cooperation, and influence of this body to the formation of a plan and the promulgation of measures by which the condition of women with cancer will be ameliorated.

In view of these facts that one woman in every fourteen dies of cancer, and that after the age of thirty-five the mortality rises to one in nine—a percentage of over 11 per cent.—that the suffering it involves is greater than that of almost any known disease, that in the present state of our knowledge relief can only come through early diagnosis, and then by appropriate radical and palliative treatment, that the principal impediment to such early diagnosis is found in the want of appreciation of medical men, of the early differentiation of symptoms which distinguish between malignancy and benignancy, that want of knowledge on the part of women to know the symptoms which require early advice, coupled too often with a false modesty to disclose their condition, and that inadequate facilities for the care of such cases make practical relief difficult if not impossible.

It is resolved, *first*, that this society by its president appoint a committee of three (one of which shall be the president him-

self), whose duty it shall be to formulate a plan whereby all practitioners of medicine shall be urged to faithfulness in making early diagnosis of suspected uterine cancer, and if doubt exists to secure the opinion of those whose experience and judgment may be regarded as authoritative.

Second, that this committee be directed to devise some method by which, along ethical lines, women may be properly informed why they should seek early advice in menstrual disorders and other conditions peculiar to themselves, and that it further consider some more comprehensive plan whereby a general diffusion of appropriate and vital knowledge on this important subject can be secured.

Third, that emphasis be given to the fact that more helpful and scientific relief can be given to this most unfortunate class of patients, than that limited to the administration of opiates and the use of the vaginal douche.

Fourth, that the time is ripe when in every populous community and some defined area of less densely settled districts, homes and hospitals should be maintained, wherein those of this helpless and neglected class (who are without financial resources) may receive adequate treatment and humane nursing. In view of the willingness of a charitable and responsive public to respond to the call of humanity to aid unfortunate sufferers, as evinced in the generous help of those suffering from tuberculosis, a campaign be undertaken under the auspices of the medical profession, public-spirited citizens, and intelligent women, for the relief of those whose suffering and helplessness is unequaled by any other class in the community.

Fifth, that this committee be instructed to consider in connection with the foregoing resolutions, the question of "ways and means" to make the work contemplated possible of accomplishment.

Sixth, that this committee be directed to report at this, or the next meeting of the association, as in their wisdom seems best, and that the committee be empowered to fill vacancies in its membership and appoint sub-committees if deemed expedient, and to perform such other duties as are needful in carrying out the purpose of this resolution.

STATISTICS OF CANCER IN THE FEMALE.¹

BY

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To get reliable statistics on such a subject as cancer it is not only necessary to see that the information obtained on this subject is accurate, but also that it is extensive enough to avoid errors of chance. With this in view we collected data bearing on the question of cancer from the mortality reports of the United States Bureau of Census covering a period of eight years, from 1900 to 1908. But the information thus obtained has some drawbacks. In the first place it gives us only the *mortality* of cancer, while cancer with its comparatively early diagnosis, improved operative technic, and rather general application of radical surgery, cannot at present be considered an absolutely fatal disease. Many cancer cases are completely cured by operative interference, and many die from intercurrent diseases. Of such cancer cases the Bureau of Census can have no record. Again, under the term cancer, the Bureau includes all malignant tumors; its cancer statistics, therefore, are in reality statistics of all the malignant tumors. To make our statistics more accurate and more complete we supplemented the data obtained from the mortality report of the census with those obtained from hospital reports. Hospital reports not only have none of the drawbacks mentioned, but in addition give us a fair statistical idea as to how early cancer is being diagnosed, an important practical point in connection with the cancer problem.

To get the hospital statistics we communicated with 604 leading hospitals in this country and Canada, and requested them to send us their latest annual reports. One hundred and fifteen of them reported that they had not been issuing any report, 209 did not answer our communication, and 280 sent us their latest report. Of these 280, sixty-one contained no medical statistics, and of the 219 in which we did find statistics, 125 had no sex division, and 40 gave no results.

This paper, then, is based on statistical data collected from the

¹ Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists held at Syracuse, September 20-22, 1910.

latest eight annual reports of the Bureau or Census, and the latest reports of 219 hospitals.

TABLE 1.

Death Rate of Cancer in General.

According to the registration area:	
Total male deaths.....	2,405,737
Total female deaths.....	2,065,505
Male deaths past thirty-five years.....	1,257,035
Female deaths past thirty-five years.....	1,082,794
Total male deaths from cancer.....	71,939
Total female deaths from cancer.....	116,210
Male deaths from cancer past thirty-five years...	67,685
Female deaths from cancer past thirty-five years..	110,375
According to the 219 hospital reports:	
Male cancer cases.....	2,754
Female cancer cases.....	5,469
Cancer cases unclassified as to sex.....	4,405

The above cited figures show that the proportion of deaths from cancer to the total number of deaths from all causes are: in females 1 to 17.7; in males 1 to 33.4. The proportion of deaths from cancer past thirty-five years to the total number of deaths past thirty-five years are: in females 1 to 9.8; in males 1 to 18.5. Taking the relative frequency of cancer in both sexes we find that according to the mortality statistics of the United States Bureau of Census 62 per cent. of those that die of cancer are females, and 38 per cent. males; according to the hospital statistics 66.5 per cent. are females, and 33.5 per cent. males. We see, then, that cancer is an exceedingly common disease in the female, and it is met with about twice as frequently in females as in males.

GRADUAL INCREASE IN CANCER OF FEMALES.

TABLE 2.

Proportion of Cancer Mortality to Total Mortality from Bureau of Census Records 1900 to 1908.

Year	Total No. of female deaths from all causes	Total female cancer deaths	Frequency of cancer
1900	253,242	11,067	1 to 22.8
1901	241,333	12,459	1 to 19.3
1902	234,092	12,802	1 to 18.2
1903	232,569	13,889	1 to 16.8
1904	254,474	14,260	1 to 17.8
1905	252,270	15,109	1 to 16.7
1906	276,536	17,943	1 to 15.4
1907	310,692	18,681	1 to 16.6

As we see from this table there is quite an increase in cancer from 1900 to 1903 (from 1 in 22.8 to 1 in 16.4) but from 1903 to 1907 the variation is not so marked. The table given by the Census based on the number of cancer cases per 100,000 population shows a more definite and continuous increase, as follows:

TABLE 3.

<i>Deaths from Cancer</i>	<i>per 100,000 Population.</i>
1900	63
1901	64.5
1902	65.3
1903	68.3
1904	70.6
1905	72.1
1906	70.8
1907	73.1
1908	74.3

Whether based on mortality figures or population figures there is clearly shown an increase in cancer from 1900 to 1908. In the eight years there was an increase in cancer mortality from 1 in 22.8 deaths to 1 in 16.6 deaths or from 63 per 100,000 population to 74.3.

The question is frequently raised whether the gradual increase in mortality is not due to changes in the methods of reporting deaths and to the greater accuracy in the diagnosis of cancer, especially in view of the slight variation for the five years between 1903 and 1907. There is no question that the bureaus of health of the large cities have lately been taking better care of the mortality statistics. Besides the gradual improvement of the medical schools, the rapid increase of hospitals with their laboratories, and the more general application of surgical treatment for surgical diseases, all increased the possibilities of more accurate diagnosis. But these factors cannot account completely for the statistical increase of cancer mortality, for if they could, there would have been no such increase in the easily recognized cancers of the skin and breasts, as the following table indicates.

TABLE 4.

Increase of Cancer of Skin and Breast.

Year	Total mortality	Cancer of skin No. Proportion	Cancer of Breasts No. Proportion
1900	253,242	208 or 1:1218	1395 or 1:1815
1901	241,333	227 or 1:1067	1621 or 1:1488
1902	234,092	232 or 1:1009	1495 or 1:1565
1903	232,569	268 or 1:867	1772 or 1:1313
1904	254,474	296 or 1:853	1771 or 1:1437
1905	252,270	279 or 1:904	1994 or 1:1265
1906	276,536	328 or 1:843	2511 or 1:1101
1907	310,692	397 or 1:782	2590 or 1:1199

Thus we see that in eight years cancer of the skin increased in frequency from 1 in 1218 to 1 in 782, and cancer of the breasts from 1 in 1815 to 1 in 1199. This increase in the frequency of the cancer of the skin and breast confirms unquestionably the belief that cancer is on the increase.

AGE AND CANCER.

TABLE 5.

Frequency of Cancer of the Female at Different Ages.

Age	Female total deaths from all causes	Female total deaths from cancer	Proportion
1 to 5 years	558,643	396	1 to 1411
5 to 10 years	54,449	159	1 to 342
10 to 15 years	34,952	179	1 to 195
15 to 20 years	60,299	332	1 to 182
20 to 25 years	88,935	646	1 to 138
25 to 30 years	95,160	1,609	1 to 59
30 to 35 years	90,273	3,423	1 to 26
35 to 40 years	91,051	6,583	1 to 14
40 to 45 years	85,107	10,045	1 to 8
45 to 50 years	84,515	12,785	1 to 7
50 to 55 years	92,467	12,933	1 to 7
55 to 60 years	97,171	14,722	1 to 7
60 to 65 years	113,985	14,924	1 to 8
65 to 70 years	122,395	13,111	1 to 9
70 to 75 years	124,154	10,599	1 to 12
above 75 years	257,521	12,787	1 to 20

TABLE 6.

The Frequency of Cancer in the Corresponding Ages of both Sexes.

Age	Male	Female
1 to 5	1:1436	1:1411
5 to 10	1: 252	1: 342
10 to 15	1: 173	1: 195
15 to 20	1: 159	1: 182
20 to 25	1: 160	1: 138
25 to 30	1: 126	1: 59
30 to 35	1: 73	1: 26
35 to 40	1: 44	1: 14
40 to 45	1: 29	1: 8
45 to 50	1: 20	1: 7
50 to 55	1: 16	1: 7
55 to 60	1: 13	1: 7
60 to 65	1: 12	1: 8
65 to 70	1: 13	1: 9
70 to 75	1: 15	1: 12
above 75	1: 21	1: 20

We see from the above two tables that the highest mortality from cancer in the female is between forty-five and sixty, reaching the proportion of 1 to 7, the mortality gradually diminishing as age increases or decreases. The highest mortality from cancer in the male is at the age between sixty and sixty-five in the proportion of 1 to 12. Only at the age between five and twenty is the mortality from cancer in the male higher than that in the female. In this connection it should be remembered that no distinction is made by the United States Bureau of Census between carcinoma and the other malignant tumors. The cancer mortality of the earlier years is, therefore, in all probability accounted for chiefly by the mortality from sarcoma, the malignant disease of the young.

CANCER GROUPS.

The Bureau of Census following the international classification divides the different locations of cancer into seven groups: (1) Stomach and liver, (2) intestines, (3) mouth, (4) skin, (5) breast, (6) female sexual organs, and (7) miscellaneous.

NUMBER OF CANCERS OF THE DIFFERENT GROUPS OF BOTH SEXES.

TABLE 7.

According to the U. S. Census:

	Stomach and liver	Intestines	Mouth	Skin	Breast	F. sexual organs	Miscella- neous
Female...	35,213	11,583	1111	2235	15,148	27,490	23,430
Male ...	34,605	8,613	4455	4153	107	not given	20,006

TABLE 8.

According to the Hospital Reports:

	Stomach and liver	Intestines	Mouth	Skin	Breast	F. sexual organs	Miscella- neous
Female...	334	275	48	146	1619	2753	294
Male ...	616	269	394	292	414	321	448
Sex un- defined	1098	569	396	682	669		1107

From the tables 7 and 8 we can construct the following table:

TABLE 9.

Comparison of the Percentages of each Group in Both Sexes

	U. S. census statistics		Hospital statistics	
	Female	Male	Female	Male
Stomach and liver.	50.2%	49.8%	35. %	64.9%
Intestines	57.3	42.7	50.5	49.5
Mouth	19.9	80.1	10.8	89.2
Skin.....	34.9	65.1	33.3	66.7
Breasts	99.2	.8	79.6	20.4
Sexual organs.....		not given	89.5	10.5
Miscellaneous	53.9	46.1	39.6	60.4

We see from the above tables that the female sex leads in number of cancers of breast and sexual organs, while the male sex leads in number of cancers of mouth and skin. Cancer of the intestines are about equally distributed between both sexes, and in cancer of the stomach both sexes are about equal in number according to the United States Census statistics, but the male

leads considerably in the hospital statistics. The reason for it may be found in the fact that cancer of this group is in the female frequently secondary to primary cancer of her sexual organs and breast, and, while the Bureau of Census coded its the deaths of the secondary cancers to the stomach and liver groups, the hospital records show only the primary seats of these cancers.

TABLE 10.

Comparison of the Hospital and Census Percentages of the Groups.

	Census statistics	Hospital statistics
Stomach and liver	30%	6%
Intestines	10	5
Mouth	1	1
Skin	2	2
Breasts	13	30
Sexual organs.....	24	51
Miscellaneous.....	20	5

We see that according to the statistics of the Bureau of Census, women die most commonly from cancer of the stomach and liver (30 per cent.), then from cancer of the sexual organs (24 per cent.), then from cancer of the breasts (13 per cent.), then intestines (10 per cent.), skin (2 per cent.), and mouth (1 per cent.); while according to the hospital cancer statistics women apply to hospitals most commonly with cancer of the sexual organs (51 per cent.), then with cancer of the breasts (30 per cent.), then with cancer of the stomach and liver (6 per cent.), intestines (5 per cent.), skin (2 per cent.), and mouth (1 per cent.).

OPERATIVE STATISTICS OF CANCER.

The point that interests us as much as any other in connection with cancer is the statistics touching on questions of early diagnosis. The only source of information in this connection is the annual hospital reports, and the only way we can judge about it is by the relative proportion of radical operations to the palliative ones.

TABLE 11

Number of Radical and Palliative Operations in the Cancer Groups.

	Radical			Palliative		
	Total	Number with results given	Deaths	Total	Number with results given	Deaths
Stomach and liver	173	140	39	339	246	56
Intestine	214	177	53	260	94	45
Mouth	473	358	19	73	42	1
Skin	401	345	14	73	36	0
Breasts	703	392	24	26	6	0
Sexual organs	789	611	64	170	121	4
Miscellaneous	491	371	37	321	247	55
	3244			1262		

This table shows us a total of 5,506 operations for cancer of which 1,265 or 21 per cent. are palliative. In other words, while the only possible cure for cancer is a radical operation, 21 per cent. of the hospital cancer cases that come for treatment, are already too late to be operated upon radically. The palliative operations with an immediate mortality of 20.3 per cent. with an unavoidable fatal termination in the near future is substituted for the radical operation with the immediate mortality of 10.4 per cent. and fair chance for recovery. Let us consider this point separately for each group.

CANCER OF THE FEMALE SEXUAL ORGANS.

TABLE 12.

Number of Radical and Palliative Operations.

	Total number	Radical operations			Palliative operations		
		Total	Results given	Died	Total	Results given	Died
Uterus.....	2479	706	557	60	123	89	2
Ovaries.....	125	35	20	3	25	17	1
Vulva.....	61	22	16	1	5	3	0
Vagina.....	54	19	11	0	13	9	0
Clitoris.....	13	5	5	0	2	2	1
Unclassified.....	21	2	2	0	2	1	0

From this table we construct the following:

TABLE 13.

Percentage of Radical and Palliative Operations.

	Per cent. total cancer of the group	Per cent. radical operations	Per cent. mortality of radical operations	Per cent. palliative operations	Per cent. mortality
Uterus	90	83.9	8.5	14.9	2.2
Ovaries	4.5	58.3	8.6	41.7	4.0
Vulva	2.2	81.5	4.5	18.5	0
Vagina	2.	59.4	0	40.6	0
Clitoris	0.5	71.4	0	28.6	50.
Unclassified...	0.7	66.7	0	33.3	0

Cancer of the female sexual organs is the largest group in hospital cancer statistics, constituting 51 per cent. of all hospital cancer cases. If we bear in mind that the mortality statistics of the U. S. census gives this group only 24 per cent., we can easily presume that this group of cancer is generally diagnosed by the profession and that it takes good advantage of hospital treatment. At the same time we notice, by table 13, that at the hospitals 82.9 per cent. of uterine cancer, 58.3 per cent. of ovarian cancer, 81.5 per cent. of vulvar cancer, 59.4 per cent. of vaginal cancer, and 71.4 per cent. of cancer of clitoris are operated upon radically, or, taking the total number of cancer of the female sexual organs, 82.3 per cent. undergo radical operations. These figures indicate that, even in this group, in spite of the general use made of the hospital by it, 17.7 per cent. are being admitted to the hospital in an already hopeless condition.

CANCER OF STOMACH AND LIVER.

TABLE 14.

Number of Radical and Palliative Operations.

	Total number	Radical operations			Palliative operations		
		Total	Results given	Died	Total	Results given	Died
Stomach.	1629	173	140	39	275	198	41
Liver.....	409	0	0	0	64	48	15

From this table we may construct the following table:

TABLE 15.

Percentage of Radical and Palliative Operations.

	Per cent. total cancer of the group	Per cent. radical operations	Per cent. mortality of radical operations	Per cent. palliative operations	Per cent. mortality
Stomach	80	38.6	27.9	61.4	19.9
Liver.....	20	0	....	100	23.3

This group constitutes 6 per cent. of female hospital cancer cases while the census gives it 30 per cent. We can see from this that a large number of this group never come to the hospital for operations, either because they remain undiagnosticated or are diagnosticated too late to get any benefit from hospital treatment. Of those admitted to the hospitals only 33.5 per cent. were operated upon radically, which means 58.8 per cent. were diagnosticated too late to be benefited by the radical operation. But the radical operation itself with its present 28 per cent. of immediate mortality is not very encouraging treatment for this unfortunate group of cancer. It may be interesting here to cite the statistical figures of stomach and liver separately.

In this group the stomach cases constitute 80 per cent. and liver 20 per cent. The liver cancer cases are all palliatively treated with the immediate mortality of 23.3 per cent. Of the stomach cases, 38.6 per cent. are treated radically with an immediate mortality of 28 per cent., and 1.4 per cent. are treated palliatively with an immediate mortality of 15 per cent. The poor status of the present treatment of cancer of the stomach is here well demonstrated; 61.4 per cent. of the stomach cases are being sent to the hospital too late for radical surgery, and the remaining 38.6 per cent. operated on radically have a discouraging immediate mortality of 28 per cent.

CANCER OF BREAST.

TABLE 16.

Number of Radical and Palliative Operations.

Total number	Radical operations				Palliative operations		
	Total	Results given	Cured	Died	Total	Results given	Died
2702	703	392	130	24	26	6	0

Percentages of Radical and Palliative Operations.

Per cent. radical operations	Per cent. cured	Per cent. mortality	Per cent. palliative operations	Per cent. mortality
96.4	33.1	6.1	3.6	0

This group of cancer constitutes 30 per cent. of the total number of cancer cases admitted to the hospital, a higher percentage than the one given in the census (13 per cent.) indicating that hospital treatment is largely resorted to in this group. The percentage of palliative operations is only 3.6, which shows that the cases with cancer of the breast are sent to the hospitals in time to get the radical operation, but the fact that only 33 per cent. are reported as cured from the operations would suggest the idea that of the 94 per cent. surviving the operations at least 61 per cent. come too late for permanent cure.

CANCER OF THE INTESTINES.

TABLE 17.

Number of Radical and Palliative Operations.

	Total	Radical operations			Palliative operations		
		Total	Results given	Died	Total	Results given	Died
Duodenum	287	117	86	12	140	111	21
Cecum	44	13	13	6	9	7	4
Appendix.	20	9	9	0	1	...	...
Colon	94	9	8	6	35	27	6
Sigmoid.	111	15	14	9	20	17	5
Rectum	336	22	...	1	1	1	...
Unclassified intestine	221	49	45	19	54	31	9

TABLE 18.

Percentage of Radical and Palliative Operations.

	Per cent. total cancer of group	Radical operations		Palliative operations	
		Per cent. total number of operations	Per cent. mortality	Per cent. total number of operations	Per cent mortality
Duodenum.....	26	45.5	13.9	54.5	18.9
Cecum.....	4	59.0	46.1	41	59.1
Appendix.....	2	90	0	10	0
Colon.....	8	20.5	75	79.5	22.2
Sigmoid.....	10	42.8	64.3	57.2	29.4
Rectum.....	30	95.6	4.5	4.4	0
Unclassified.....	20	47.5	42.2	52.5	29

The intestinal group of cancer in hospital statistics gives the female 5 per cent. of the total female cancer cases while the census credits the female sex with 10 per cent. This difference suggests the idea that a large number of cancer of the intestines is either not diagnosticated before death or is diagnosticated too late to take advantage of surgical treatment at the hospitals. At the same time we notice by table No. 11 that 55.9 per cent. are operated upon palliatively, confirming still more forcibly the idea that the diagnosis in cancer of the bowels is usually made too late. In this connection it may be interesting to notice the percentage of radical operations on the different parts of intestines. Cancer of the rectum, with its early development of symptoms, easy access for diagnosis and operative procedures, leads with 95.6 per cent. of radical operations, cancer of the appendix, with its symptoms suggestive of appendicitis, easy access and simplicity of operative treatment, and readiness of patients to be operated on for appendicial disease, follows with 90 per cent. The cancer of cecum, also suggesting by its early symptoms appendiceal trouble, has to its credit 59 per cent. of radical operations; cancer of the duodenum and sigmoid with their comparatively early development of symptoms, and proximity of the first to the stomach and the second to the rectum, give, respectively, 45.5 per cent. and 42.8 per cent. of radical operations. The colon, least accessible and latest in development of symptoms, has only 20 per cent. of radical operations.

CANCER OF THE SKIN.

TABLE 19.

Number of Radical and Palliative Operations.

	Total	Radical operations			Palliative operations		
		Total	Results given	Died	Total	Results given	Died
Skin unclassified	350	75	55	8	20	13	0
Skin head	40	12	11	1	0	..	..
Skin neck	135	69	62	5	15	8	0
Skin face	303	136	115	0	22	9	0
Skin nose	119	19	25	0	5	3	0
Skin eye	71	33	33	0	4	1	0
Skin ear	24	15	12	0	0	..	..
Skin extremities	131	42	32	0	7	2	0

The above table reduced to percentages gives the following:

TABLE 20.

Percentage of Radical and Palliative Operations.

	Per cent. of total cancer of group	Per cent. of radical operations	Per cent. mortality	Per cent. palliative operations	Per cent. mortality
Skin unclassified .	30	80	14.4	20	0
Skin head	3	100	9	0	0
Skin neck	11	82	8	18	0
Skin face	27	86	0	14	0
Skin nose	10	79	0	21	0
Skin eye	6	89	0	11	0
Skin ear	2	100	0	0	0
Skin extremities .	11	89	0	11	0

The skin group of cancer constitutes 2 per cent. of hospital cases (table 10). The census gives it the same per cent. The hospital treatment is therefore general. As far as taking advantage of radical operations is concerned, this group shows up very favorably according to the tables 19 and 20. The lowest percentage of radical operations is credited to cancer of nose and this is quite high (79 per cent.).

CANCER OF MOUTH.

TABLE 21.

Number of Radical and Palliative Operations.

	Total	Radical operations			Palliative operations		
		Total	Results given	Died	Total	Results given	Died
Lips	398	298	222	7	10		
Cheek	58	23	5	0	9	4	0
Tongue	204	68	56	10	27	14	0
Tonsils	13	12	8	2	0		
Unclassified	153	72	67	0	27	24	1

Reduced to percentage we get the following table:

TABLE 22.

Percentage of Radical and Palliative Operations.

	Per cent. total cancer of group	Radical operations		Palliative operations	
		Per cent. total number of operations	Per cent. mortality	Per cent. total number of operations	Per cent. mortality
Lips	48	96.7	3.1	3.3	
Cheek	7	71.8	0	28.2	0
Tongue	25	71.5	18	28.5	0
Tonsils	2	100	16.6		
Unclassified	18	72.7	0	27.3	4.1

The mouth group of cancer constitutes 1 per cent. of all hospital cancer cases; the census gives it the same percentage which indicates that the group of cancer takes good advantage of hospital treatment. At the same time we notice by Table 22 that 96.6 per cent. or 6 in 7 are operated upon radically. The most common seat of cancer of mouth (48 per cent.) is the lips, and of the total operations performed for cancer of lips 96.7 per cent. is radical. Cancer of the tongue, which constitutes 25 per cent. of total number of cancer of mouth, is credited with 71.5 per cent. of radical operations, cancer of the cheek (7 per cent. of total mouth cancer) has 71.8 per cent. of radical operations, while all the cancers of the tonsils (2 per cent. of the total mouth cancer) are reported as radically operated upon (Table 22).

We may then say that the diagnosis of cancer in this group, judging by the rather high percentage of radical operations, is satisfactorily early.

MISCELLANEOUS GROUP OF CANCER.

Under this heading we shall select only the organs in which cancer is more or less commonly met with. Placing them in order of frequency we get the following table:

TABLE 23.
Number of Radical and Palliative Operations.

	Total number of cancer	Radical operations			Palliative operations		
		Total	Results given	Mor- tality	Total	Results given	Mor- tality
Esophagus	234	4	2	0	49	38	9
Bladder	214	10	6	0	52	47	10
Bones and joints...	154	86	75	7	21	10	1
Pancreas.....	133	..	..	..	35	29	14
Gall-bladder	90	11	10	3	39	32	5
Larynx.....	79	11	10	4	10	8	2
Kidney.....	51	9	7	3	9	8	3
Thyroid.....	38	9	6	1	5	4	1

From the above table we construct the following:

TABLE 24.
Percentage of Radical Operations.

	Per cent. total cancer of this group	Per cent. radical operations
Esophagus	24	7.5
Bladder	22	16
Bones and joints	15	80
Pancreas	13	0
Gall-bladder	9	22
Larynx	8	52
Kidney.....	5	50
Thyroid	4	64

We see in this last group, as in all the others, that the more accessible an organ, the more definite the characteristic symptoms and the easier the radical operation, the earlier is the patient operated upon and the higher is the percentage of the radical operation.

CANCER IN THE COLORED RACE.

An interesting point for investigation is statistics of cancer of the colored race. Unfortunately, the statistics collected by the Bureau of Census are meager. Only in the partial report for 1908 (the last obtainable) is an attempt made to give us information on this question and then without any sex classifications. This information is based on statistics collected in the cities of Baltimore, Washington, Louisville, New Orleans, Kansas City, Memphis, and rural districts of Maryland. According to this statistics the mortality from cancer per 100,000 population of the colored race is 50.2, while that in the white race is 71.7. This lower death rate of cancer in the colored race, a difference of 21.5 per 100,000 population, can in our opinion be explained not so much by the greater resistance of the race to cancer as by the fact that their mortality in the precancerous age is much higher than that in the white race. Studying the general mortality of the colored race for 1906 and 1907, we are struck with the fact that its highest mortality, excepting infancy, is reached at the age between twenty-five and thirty, while that of the white race between sixty-five and seventy; in other words, the colored race die proportionately in larger numbers in the precancerous age than the white race. We can make this point clearer by the following statistical observation for 1906 and 1907.

Deaths from all causes and all ages	{ In the white race 1,401,103. In the colored race 89,099.
Deaths from all causes prior to age 35	{ In the white 601,498, or 42.9 per cent. of total number. In the colored 51,209, or 57.4 per cent. of total number.

In other words, proportionately 14.5 per cent. less of the colored race reach the cancer age than does the white race. It may be of interest in this connection to state that the higher mortality of the precancerous age of the colored is chiefly due to the prevalence of tuberculosis. Thus in the above cited territory we find 457.4 deaths from tubercle bacillus to 100,000 of colored population, while only 179 to 100,000 of white population, the death rate of the colored from tuberculosis being two and one-half times as high as that of the white. If to this higher mortality in the precancerous age we add the probability of more frequent mistakes in diagnosis among the colored people than

the white, we certainly can be justified in doubting the greater resistance to cancer in the colored race than that in the white race.

THE FREQUENCY OF CANCER IN DIFFERENT STATES AND COUNTRIES.

There seems to be a difference in death rate from cancer in the different states. How much value can be attributed to purely territorial influences on the resistance of its population to cancer is difficult to determine, but, in, our judgment, it cannot be great. Studying the death rates from cancer statistics in the states of the registration area for the years 1900 to 1908 without distinction as to sex, we find the death rate in some of them strikingly different in the different years.

Thus per 10,000 it ranges in

New York, between 66.7 and 89.9, a difference of 23.2.

Vermont, between 69.1 and 99, a difference of 29.9.

Maine, between 74.6 and 101.3, a difference of 26.7.

New Hampshire, between 71.9 and 95.8, a difference of 23.9.

Pennsylvania, between 41.5 and 62.8, a difference of 21.3.

Massachusetts, between 74.6 and 93.5, a difference of 18.9.

Such striking differences could not be possible if purely territorial peculiarities were a great factor in the death rate of cancer. But how can we account for such differences as, for example, 38.8 per 100,000 in South Dakota, and 101.3 in Maine? If there are no inherent peculiarities to account for the difference, how can this difference be explained? It seems to us that there are many factors independent of the territorial peculiarities that can account for it. The industries attracting large numbers of employees in their precancerous age, the economical and intellectual standard of population with its influence on mortality, especially on mortality in the precancerous age, the degree of proficiency of the medical profession and that of its hospitals, the accuracy of the Census Bureau health statistics, all these must constitute great factors influencing the reports on mortality of cancer in the different states. Information on all these points would be of great value in determining the question of territorial influence on cancer, but such information is not at our disposal.

These same considerations may with equal force apply to the difference in the death rate from cancer in the different countries.

CONCLUSIONS.

Hospital statistics, if carefully and properly compounded, can be utilized to great advantage by the profession in many ways.

The modern hospital organization and facilities, the gradual increase of the number of hospitals all over the country, the more general use of the hospitals by the sick, the greater readiness by the profession and patients to adopt surgical measures for surgical diseases—all this makes the hospital the most valuable source of statistical medical information. But to get accurate information, not only must each hospital have a careful conscientious statistician, but the visiting members of the hospital staff must see that their diagnoses are carefully reported in the hospital records. The practice of leaving the collection of the statistics to the inexperienced internes should be abandoned, especially in large institutions, and a paid responsible registrar put in charge of the hospital records. Of the 395 hospitals we heard from, 115 or 29 per cent. issue no reports, sixty-one or 15 per cent. issue reports but with no medical statistics, 165 or 42 per cent. issue reports with incomplete medical statistics, and only 14 per cent. issue reports with complete medical statistics. Quite a number of our leading hospitals, generous in their treatment of patients, and sparing nothing to advance their medical work, neglect to give the profession their statistics in their otherwise complete and elaborate annual reports. If we could have all the hospital reports as carefully classified as in the Bellevue and allied hospitals of New York, Boston City Hospital, and the Massachusetts General of Boston, if we could have all the operative hospital statistics as clearly and fully reported as in the Pennsylvania Hospital of Philadelphia and the Roosevelt of New York, the medical profession could utilize the hospital reports in its statistical studies to a much greater degree than it can at present.

JENKINS BUILDING.

RECENT ADVANCES IN THE TECHNIC OF THE
RADICAL ABDOMINAL OPERATION FOR
CANCER OF THE UTERUS.¹

BY

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FOR a number of years I have been impressed by the poor results which have been and are being obtained in this country from operations for the relief of uterine cancer and, on the other hand, by the better results obtained by continental operators with the more radical abdominal operations for the cure of this disease. It was this impression which led me to compile a statistical study of the results obtained from the radical abdominal operation, and to contrast them with the results from other operations. This was done in order to determine definitely what particular operation gave the best results for uterine cancer. For this statistical study, 2765 radical abdominal operations were collected from the literature and from personal communication with operators in this country, the report of this study being made before the gynecological section of the American Medical Association at its meeting in St. Louis, June, 1910.(1)

In the above report it was shown that, as far as it can be determined at the present time, the average operability of all cases observed is 65.17 per cent. by the radical abdominal operation; that the average general primary mortality is 19.94 per cent.; that the permanent cures five years after operation in the hands of five different operators were 40.72 per cent., while the absolute cure of all cases observed during a period of from two to six and a half years after operation in the hands of five operators was 21.14 per cent. It was also shown in my statistical study that although there is an apparent high primary mortality with this operation, that this mortality rate is more than offset by the high percentage of operability which this operation possesses; that a greater familiarity with the method not only reduces the operative mortality but increases one's own operability as well, and lastly that in the hands of individual operators the mortality

¹ Read at the twenty-third annual meeting of the American Association of Obstetricians and Gynecologists held at Syracuse, September 20-22, 1910.

rate has been decreased far below the general average (Doderline, 14.3 per cent.; Jacobs, 6.37 per cent.; Klein, 12.8 per cent.; Zweifel, 10.8 per cent.; Wertheim, 10 per cent. Ruben Peterson in a series of twenty-two cases, 4.5 per cent.).

From these facts it is at once clear that the radical operation in spite of its apparently higher primary mortality has a greater percentage of cures to its credit than has any other method of operation. It is a lamentable fact that although the pioneers and originators of the operation (Ries, Clark, Werder) were American it has remained for the German gynecologists to perfect, develop, and to put the operation into general use; but in this country, with all our boasted superiority in technical surgery, it has not received the attention it deserves.

From the afore-mentioned statistical review I have become convinced that the main problems to be solved in the surgical treatment of uterine cancer lie chiefly in the further reduction of the primary mortality of the radical abdominal operation. I have compiled and give herewith the various methods of procedure for the performance of the radical abdominal operation as they are found in the literature in the hope that such a review will be of service in not only tracing the evolution of the modern operation of to-day, but as an aid in the more general adoption of the method.

1878.

The first abdominal hysterectomy for cancer of the uterus successfully performed by W. A. Freund of Breslau.

1895.

Ries(2) recommended the following operation in March, 1895.

1. In carcinoma of the portio the cancerous tissue is cut and scraped away, the bleeding surface is thoroughly cauterized and shut off from the field of operation by flaps of the vaginal wall which are sewed together over the os. In cases of cancer of the cervix or of the body where the portio is well preserved, the cavity is scraped, washed out, and packed with iodoform gauze, the os is then closed with sutures, and the vagina is packed with iodoform gauze.

2. The patient is put in Trendelenburg's position. Laparotomy. Removal of the uterus, the ovares, tubes and broad ligaments, as described by Freund in 1878, or by a slightly modified method, as used by Mackenrodt before he employed the thermocautery.

3. Taking the bifurcation of the common iliac artery as the starting-point the peritoneum is cut open on the posterior wall of the pelvis and the glands are dug out with the surrounding connective tissue by the sole aid of the fingers.

4. The peritoneum is closed with sutures here and above the vagina if this has not been done previously. Suture of the abdominal wall.

"I have not had an operable case of cancer since I have finished my studies on this method and the twenty-six cases of operable cancer I have operated on were all operated without removal of the iliac glands. But I am very glad to acknowledge my indebtedness to Dr. Rumpf, of Berlin, who has recently done for the first time and with full success the operation invented and described by me."

Rumpf(3) on June 28, 1895, reported the following operation before the Gesellschaft f. Geburtsh. u. Gynaek. of Berlin.

The operation was made on a patient with a carcinomatous cervix. After bilateral ligation of the ovarian vessels close to the linea innominata the posterior surface of one broad ligament was divided along and somewhat below the line of the great vessels; the ligament from the seat of the ligature to the uterus was opened without cutting, and the ureter exposed for some distance. The anterior surface of the ligament was then split in the same way at the same level from without inward, so that the round ligament could be ligated separately; the same thing was done at the other side and, the anterior cuts having been joined, the peritoneum was bluntly detached from the lower part of the uterus and from the bladder. The ureters could now be held aside, the entire contents of the parametrium was detached without cutting, and the uterine arteries ligated close to their junction with the hypogastric. Portions of swollen grayish-red lymphatics were taken away on either side, also the greatly thickened ligamenta sacrouterina, and with them the entire floor of Douglas' pouch was completely extirpated so that the rectum was laid bare. The uterus was now drawn forcibly upward and, with the use of Fritsch's indicator, was separated from the vagina as low down as possible all around with the Paquelin cautery. Strips of sterilized iodoform gauze were passed into the vagina, filling up the now nearly empty pelvis, and over this gauze, by means of the flaps of peritoneum and by the union of the folds of the ligamenta lata on either side together with suture of the anterior vesical flap to the anterior

wall of the rectum, a roof was formed completely closing the peritoneal cavity.

Clark(4) states that in April, 1895, he performed an operation whose essential steps differed from the other operation employed for cancer of the uterus: 1. The introduction of ureteral bougies; 2, ligation of upper portions of the broad ligaments, including the round ligaments and ovarian arteries, cutting them close to the pelvic walls, opening the two layers and dissecting the uterine artery out to its origin and ligating before excising any tissue; 3, the excision of a much larger portion of the vagina than usual (reported two cases).

Steps of Operation.—1. Insert bougies into the ureters under the local effects of cocaine, thus saving time and conserving the patient's vital powers for the operation.

2. Make an abdominal incision of sufficient length to insure free manual movements.

3. Ligate the upper portion of broad ligament together with the ovarian artery; divide the vesicouterine peritoneum around to the opposite side; push the bladder off, and spread the layers of the broad ligament apart, thus exposing the uterine artery.

4. Dissect the uterine artery out for 2 1/2 cm. from the uterus beyond its vaginal branch and ligate the same.

5. Dissect the ureter free in the base of the broad ligament.

6. Ligate the remainder of broad ligament close to the iliac vessels and cut it away from its pelvic attachment.

7. Carry the dissection well down below the carcinomatous area, even though the cervix alone seems to be involved.

8. Proceed on the opposite side in the same manner as on the first side.

9. Perforate the vagina with a sharp-pointed scissors, making strong traction on the uterus with a small vulsellum forceps so as to pull the vagina up and make its walls tense, then ligate in small segments (1 cm.) and cut each segment as it is tied.

10. Insert iodoformized gauze from above into raw space left by the hysterectomy; draw vesical and rectal peritoneum over this with a continuous fine silk suture.

11. Irrigate the pelvic cavity and close the abdomen without drainage.

1896.

Pryor(5). "In all cases of cervical cancer where the infection has extended to the pelvic glands; in all cases of recurrence after

hysterectomy, and in so-called inoperable cases I advocate the ligation of both internal iliac arteries as a step preliminary to any other operation. My object is to remove all the tissue I can, and what I cannot remove I want to starve.

"The abdomen is opened by a long incision in the middle line and extending from the pubes to near the umbilicus. We must have room to admit light and to work. The patient is now thrown into Trendelenburg's posture. After working the intestines into the abdomen they are kept there by several large gauze pads. The bifurcation of the aorta is now felt for and the finger runs down the right common iliac until its bifurcation is reached. The division of the common iliac is easily made out, and the examining finger is passed down the internal iliac artery for one inch. A careful search is now made for the ureter which can usually be seen as a line of fibers beneath and somewhat paler than the peritoneum. It can be made to stand up prominently by gentle pressure, for a space across the internal iliac artery, the finger crossing the ureter and constricting it, thus causing it to fill with urine. Having determined the location of the ureter, the peritoneum just at its side is pricked up and nicked with scissors. Further dissection about the artery is done with the aneurysm needle, which instrument is gently worked around the vessel from above downward, the ureter being held aside. The ligature is then drawn under the artery and tied only tight enough to occlude the vessel but not to rupture its coats. The peritoneum is now stitched over the ligature. Upon the left side the procedure is the same, only the rectum must be drawn to the right. The ovarian arteries are next tied close to the pelvic brim. What else is done will depend on the extent of the disease. If the pelvis is filled with a mass of diseased tissue I would seek to remove the uterus only for the sake of getting a drainage space.

"If the case is one of recurrence I would take away as much of the nodule as possible without entering the bladder or rectum, remove all the glands I felt enlarged, and close the belly, leaving the vagina open above. Should I find a condition of cancer with gland enlargement, I would then follow down the ureters carefully right to the bladder, remove the uterus and broad ligaments, dissecting close to the bladder, clear the space beneath the broad ligaments, and remove such of the iliac glands as I safely could. To trace the ureters down, the peritoneum must be split upon a grooved director. The peritoneum is necessarily

removed from all the pelvic floor except where it covers the rectum.

"The opening left in the vagina should be packed with gauze loosely, so as not to exert pressure; and it will probably be useless to employ sutures in the bladder, as they will slough through. Still, experience may show that the small arteries from the external iliac will be sufficient to nourish the bladder."

1898.

Werder's operation(6) was described by himself as follows:

"The whole vaginal portion was very easily removed by a sharp spoon curet, as it was completely broken down by the disease. The remaining bleeding surface was smeared over with the thermocautery. The patient was then prepared for laparotomy. After the ovarian arteries were secured the bladder was separated, not only from the uterus, but also from the broad ligaments on either side as far as possible, so as to get the ureters out of the way. This opened up both broad ligaments, and the uterine arteries could be easily traced over to near the pelvic bones where they were tied without difficulty. An assistant having inserted two fingers into the vagina as guides, the dissection between bladder and vagina was then carried down to within about an inch of the vulva. The sacrouterine ligaments were then divided with scissors, the rectum separated from Douglas' pouch, and, with two fingers, the dissection extended down to the lower half of the vagina. The lateral walls of the vagina were then freed from their attachments. The uterus and vagina were now only held by the base of the broad ligaments, which were very firmly bound to the vaginal fornices, the separation of which formed the only really difficult part of the operation. This having been accomplished and the broad ligaments completely divided, the finger could be passed all around the uterus and vagina, and at no place had the vaginal tube been opened. The loss of blood during the whole operation was insignificant. The uterus and vagina were then pushed down into the pelvic outlet, and the bladder with its peritoneal flap drawn across the pelvic cavity and stitched over the rectum to the posterior wall of the pelvis, thereby completely shutting off the pelvis from the general peritoneal cavity and covering up all raw surfaces with peritoneum. The abdomen was closed in the usual manner.

"The operation having been done in the Trendelenburg pos-

ture, the patient was now replaced into the ordinary lithotomy position. The uterus, which was protuding at the vulva, was seized with volsella forceps and drawn completely out of the vulvar orifice with the inverted vagina. With a finger in the rectum and a sound in the bladder, as safeguards against injuring these organs, the inverted vagina was amputated with the thermocautery. An inspection of the pelvis showed a large raw cavity lined in front and above by the bladder, behind by the rectum, about four inches of which were completely exposed, and below by a very short vagina. The cavity was lightly packed with gauze and the patient returned to bed. Duration of operation, two hours."

"Jacobs(7) reported the following operation: if there is much discharge from the cervix he cauterizes it just before operation. Trendelenburg's position; laparotomy; median incision down to pubis. Uterus and adnexæ are freed.

In this article he words his description somewhat differently from the one in his subsequent paper in 1908. Here he makes a transverse incision through the cervix and removes the uterus and adnexæ before he seeks the lymphatic glands in the cellular tissue and along the vessels for removal. This done, he carries out the last step in the total extirpation. He introduces one branch of a pair of scissors into the cervical canal and incises the canal directly from above downward down to the vagina, introduces the finger to guide. The cervix is then carefully freed from its attachments and removed. The vaginal walls are united by suture, the new vaginal vault covered by peritoneum from the lateral layers. A third suture (seroserous) covers the base of the bladder.

Ries(8) gives again his method with some slight changes which he has used in three cases.

First, a preliminary through curetment and cauterization of the carcinomatous surface is made under anesthesia the day before the main operation; this anesthesia is utilized for a careful search for enlarged pelvic glands palpable through the vagina, the abdominal walls, or the rectum.

In the beginning of the main operation the carcinomatous surface is shut off from the field of operation by a suture of the vaginal portion if the cancer is inside the cervix, or by a vaginal cuff closed over the vaginal portion if the cancer is located on the portio vaginalis. Fresh instruments, towels, sponges, and the like are to be used for the rest of the operation. Pa-

tient is placed in a steep Trendelenburg position, and an incision from pubis to umbilicus is made; then follows palpation and inspection of pelvic organs and the large blood-vessels from the aorta down to Poupart's ligament and to the uterine artery. If enlarged and immovable glands are found it is advisable to cut the operation short and to do only such palliative work as will afford as little danger to the patient's life and as much protection against hemorrhage, discharge, and pain as possible. If no such enlarged glands are present Ries proceeds as follows: First the right infundibulopelvic ligament is ligated close to the pelvic wall, a clamp covers the broad ligament between ligature and uterus, and the ligament is cut through between ligature and clamp. The peritoneum is incised along the common iliac vessels and the vessels are further exposed by blunt or sharp dissection. Pushing the peritoneum back toward the side, one soon reaches the ureter which crossed the common iliac vessels on or near their bifurcation. The ureter is then laid bare from the brim of the pelvis down to its point of entrance into the bladder by the aid of an incision through peritoneum of the vesicouterine pouch. The blood-vessels cut during this procedure are ligated or temporarily provided for with clamps. The uterine artery is plainly seen in this dissection at a point where it crosses the ureter and can easily be ligated at its starting-point.

Then follows the removal of the lymphatics with their surrounding fat and connective tissue as cited in his first paper, either by blunt or sharp dissection. The area which is cleaned out in this way extends over a surface limited by the lateral edge of the external iliac vessels superiorly, the pelvic wall laterally, the bladder anteriorly, the pelvic floor inferiorly, and posteriorly by the mesorectum which, however, is lifted up and freed from all accessible glands. Bleeding vessels are ligated or when the hemorrhage comes from the side of the uterus it is checked by clamps or simply by pulling hard on the uterus. All existing adhesions are cut as close to the rectum as possible. The right side being finished the left is then taken up in the same manner, special care being exercised to empty the mesorectum as completely as possible without injuring too many of the hemorrhoidal vessels. The ureter and uterine artery are treated in the same way and the removal of fat and connective tissue with the lymphatics is performed to the same extent as on the other side. Again the peritoneum is

left open, hemorrhage stopped by ligation of the blood-vessels. The round ligaments are severed close to the anterior abdominal wall.

The peritoneum of the culdesac is now incised close to the rectum and the vagina is perforated here, either against the finger of an assistant or against gauze introduced into the vagina. The vagina is severed after its walls have been secured by ligatures. The uterus is freed all around in this way and removed.

"We now," to quote his words, "have to deal with a wound which can be closed toward the peritoneal cavity by suturing the peritoneal edges left in removing the broad ligaments and the uterus. This suture runs across the bottom of the pelvis in a transverse direction uniting laterally the edges of the peritoneum of the vesicouterine and rectouterine pouches and in the median line the peritoneum of bladder and rectum. Before this stage of the operation is finished the space between peritoneum and cut edges of the vagina is filled with iodoform gauze if there be any oozing or, if everything is perfectly dry, the cut edges of the vagina and peritoneum can be united so that the vagina and peritoneum are both closed and no dead space is left between them. Closure of the abdominal wound now follows. The patients receive the same after-treatment as other laparotomy patients and may get up as early as any of them."

1900.

Wertheim reported his special technic (see below his description of the operation in 1907).

Jacobs,(9) after opening the abdominal cavity and pressing back the intestines with the patient in the elevated position, raises up the uterus as high as is possible with his hands (fingers); Museux's forceps may wound the friable uterus so he does not use them. An incision is made which opens the broad ligament; handing the uteroadnexal mass to an assistant he searches for cancerous glands and tissues, dissects everything found diseased, next he places a small Pean's forceps on the uterine artery very near its emergence from the iliac artery. This enabled him to remove the artery, the veins, lymphatics, and glands; it also enables him to avoid a lesion on the ureter. The foregoing having been done on both sides, he removes the uterus by transverse section of the cervix above internal orifice. For the sake

of prudence he immediately introduces the thermocautery into the cavity of the cervix. He grasps the neck above with Museux's forceps and frees it from the bladder as low as possible. With the aid of the fingers he rapidly ascertains the exact situation of the vaginal portion of the uterus. The vagina is transversely divided low down. The cervix is removed and a tampon is placed into the vagina at once and the canal closed with sutures. Two silk ligatures are placed around the ovarian and uterine ligaments and a third one around the round ligament, and finally the broad ligaments are closed by a catgut suture, all the ligatures emerging under the peritoneum. He rarely uses vaginal drainage. If for any reason he suspects postoperative infection he places a subperitoneal drain for twenty-four hours, using a strip of gauze per vaginam.

Before the operation he douches the vagina and cervix for several days and packs it with formalin tampons. A formalin tampon is applied to the cervix just before the operation; after removal of the neck the pack is carried nearer the vulva.

1901.

Mackenrodt(10) states that for years he has combined the vaginal with the abdominal operation by making a lateral longitudinal incision along the margin of the rectus down to the peritoneum, then pushing the unopened peritoneum away from the lateral pelvic wall he removed the ureter attached to the peritoneum and implanted it into the bladder. For the removal of the glands he made the incision on both sides of the rectus muscle margins, pushed back the unopened peritoneum from the pelvic wall and exposed the lateral pelvic cavity, thus making the glands accessible, removed them, took care of the ureter (*Ureter versorgt*), removed the "Bandapparat" from the pelvic fascia and isolated it, and when the operation had been completed on both sides he completed the extirpation by *igniextirpation per vaginam*.

He abandoned this method and tried to extirpate the uterus from above retroperitoneally through one of the incisions in the rectus margin by way of one of the two lateral pelvic cavities. After the ligamentous apparatus had been freed on both sides he split the peritoneum of one lateral cavity, pulled out the uterus, freed it from its attachments and removed it. As the ureter was either injured or showed impairment during convalescence he proceeded a step further. He attempted a median incision,

opened the abdomen in the linea alba, pushed the peritoneum of the anterior abdominal wall back unopened; it was then opened transversely and sutured behind the extracted uterus to the posterior pelvic wall, thus the abdominal cavity was immediately closed again at the beginning of operation. The extirpation of the uterus from the posterior and lateral ligaments was effected, care being taken to preserve the ureters intact. But when he attempted to remove the pelvic glands he found this most difficult, in fact impossible. He attempted this operation only once.

At the next operation he changed his *modus operandi* again. Used bilateral incisions along the margins of the recti and combined them with a "suprasympheal" transverse incision. This gave a horseshoe-shaped opening. As soon as the recti muscles above the symphysis had been divided the hand was pushed into the wound, the unopened peritoneum was dissected from the tongue-shaped abdominal flaps; in the peritoneum, as the bladder was divided transversely, the uterus lifted out and separated from the peritoneal ligamentous apparatus; the peritoneum now freed from the anterior abdominal wall was sutured to the posterior pelvic wall from one side across the flexure to the other side, so that the abdominal cavity was again completely closed, while beneath or below this closure the smaller pelvis with uterus, bladder, and rectum lay exposed. The uterus was now drawn out and found adhering by its ligamentous attachments to the vagina, bladder, and rectum. He then pushed the peritoneum away from the lateral pelvic wall, removed the glands retroperitoneally down to the bifurcation of the aorta. The uterus was removed, the wound drained and filled with iodoform gauze; closure with button sutures.

Mackenrodt operated in this manner on five patients: four died from septic infection in spite of all of these precautions, although the carcinoma did not come in contact with the wound during the operation as the vagina was clamped with large angular clamps. The infection came from the vagina and from the greatly exposed rectum.

After these attempts he made the operation again in a similar way, but proceeded differently in the care of the wound. He pulled down the bladder, and as soon as the uterus and vagina had been removed he immediately sutured the peritoneum of the bladder to the stump of the sacrouterine ligaments, so that the bladder was tense like a roof over the vaginal cavity and

over the exposed rectum. This space received a special drainage to the vagina just before the final suture. The two lateral cavities were closed by suture of a peritoneal fold to the margin of the abdominal wall wound. These closed cavities received a drainage hole through the abdominal wall and were drained by a tube with gauze wick. Finally the space over the bladder was drained over the symphysis through the abdominal wall.

Six cases operated on in this way recovered. One case died as the result of injury to the hypogastric artery, the ligature having become loosened.

In speaking of preliminary preparation for operation he states: The vagina is washed with formalin solution, curetted, tamponed, and the tampon renewed a second time; immediately before operation it is taken out and a fresh sublimate tampon placed in. During the operation the vagina is clamped with angular clamps before the amputation and then divided with the cautery. He recommends that the ureters be freed only at the points where they pass through the ligaments—no farther; in other respects he treats them with the same care as he does in his previously described method.

Amann(11) performed his method of extraperitoneal operation for the first time April 18, 1899. The patient is prepared for several days in advance by a thorough disinfection of vagina and cauterization of the carcinoma; the vagina is packed with iodoform gauze. The patient is placed in a steep pelvic elevated position, a median incision is made down to the symphysis, and at right angles to this an incision is made down over the horizontal branch of the pubis about 10 cm. to the left, eventually only one transverse incision over the symphysis may be made. These incisions divide the abdominal wall down to the peritoneum and sever the left rectus muscle from the pelvis.

Dull dissection from the *cavum Retzii* into the paravesical and paravaginal spaces without tearing the easily separated peritoneum. A round cord will be dissected but in the left inguinal region. The *ligamentum rotundum*, this is doubly ligated and divided. By progressive advancement in the paravaginal tissue one arrives at the left ureter; this is exposed by the aid of two tissue forceps and at the same time exposing the uterine artery which rests over it. The latter is ligated as far outward from the ureter as is possible; this permits the ureter to be shelled out of the carcinomatous infiltrated parametrium. The bladder is severed from the anterior part of the uterus and

vagina. Until now the peritoneal cavity has remained closed. Now the peritoneum is loosed from the posterior bladder wall and is opened with scissors for about 3 to 4 c.c. immediately in front of the excavatio vesicouterina. The fundus uteri with the adnexa are drawn through the slit by a bullet forceps and the infundibulopelvic ligament on both sides ligated and divided. The bladder peritoneum now lying behind the body of the uterus is immediately united by continuous catgut sutures with the peritoneum of the posterior pelvic wall, so that the peritoneal cavity is completely closed. By holding the left ureter to one side with a spatula or thread loop the left parametrium may be removed as extensively as is required, the sacrouterine ligaments are removed with scissors or thermocautery; the uterus is now grasped and by freeing the right ureter from the broad ligament the latter is also removed. The posterior pelvic wall is palpated and all infiltrated glands are readily removed. Iodoform gauze is conducted through the angles of the wound and through the vagina.

1902.

Amann⁽¹²⁾ believes his extraperitoneal principle of operation to be especially efficient when extensive removal of the glandular and connective tissue is contemplated. The fact that Mackenrodt simultaneously conceived the same idea speaks in its favor.

More recently he has effected the following modifications: In order to compromise the bladder blood supply as little as possible he has dissected free the vesical artery and protected it as much as possible during the operation, although it delayed the course of the operation somewhat. Following the ureter to the bladder and ligating all the tissue over the ureter includes the vesical artery, hence the subsequent disturbances of cystitis so often encountered. He always completely exposes the ureters, but finally again covers them with sufficient tissue. He emphasizes this—cover of the ureters. The bladder, entirely free from the anterior pelvic wall and its peritoneum, is then sutured to the rest of the anterior vaginal wall by folding backward the posterior bladder wall (*nach hinten geschlagen*), and it thus comes to lie over the vaginal opening on the anterior rectal wall. Prior to this the ureters are placed laterally along the rectal wall and in addition covered with the everted bladder peritoneum. The lateral parts of the bladder are sutured around the ureters to the outside of the rectal wall. Thus the two ureters are closely

approximated and with the rectum are completely encircled by the bladder. The two upper tips of the vesical peritoneum are sutured laterally to the exposed muscoli ileopsoas.

Drainage.—Care should be exercised to insure that no drainage material is in contact with the ureters; drainage should be extensive. He has abandoned the main drainage through the vagina. Places very little iodoform gauze in vagina. From above he drains the upper lateral pelvic cavities with iodoform gauze through the lateral wound angles. The main drainage he carries out with a glass or rubber drain placed laterally along the sides of the vagina through to the vulva in the vicinity of the right and left labium majus. The wound cavity diminishes much more rapidly in size with this method than with any other. The drain is placed in the following manner: after the removal or cleaning out of the pelvic cavity the tissue to the right and to the left of the vagina is separated with the finger until the latter protrudes at the skin of the labia majora; at the point where the fingers project a "Kornzange" or placental forceps is pushed forward and an incision made over the spot from without. The drainage-tube is then introduced from above and with it a small amount of iodoform gauze. The drainage-tubes remain for a long time and must be kept apart from the ureters; through the tubes he frequently, when necessary, irrigates the cavity with physiological salt solution, later with alcohol.

1903.

Mackenrodt(13) again describes his operation as in his previous article, and states that since the introduction of Mikulicz's drainage he has operated successfully on all of the most complicated cases which have progressed to the limit; only one died, this was due to heart failure.

1904.

Jonnesco(15) disinfects the vagina two or three days prior to the operation by using abundant douches of permanganate of potash and oxygenated water twice a day and tamponing with iodoform gauze after each irrigation. Just before operation the vagina is again cleansed and a loose tampon inserted so as not to cause distention of vaginal walls. The patient is placed in the pelvic elevated position; laparotomy; median incision from pubis to umbilicus. Removes the white line entirely. The peritoneum is opened and the previously prepared strips of

gauze are inserted. Then follow isolation of the adnexa, section of the infundibulopelvic and round ligaments between ligatures, section of the broad ligaments. Ligature of the hypogastric arteries, decollement of the bladder, dissection of the ureters, freeing and division of the uterine arteries between ligatures. Incision of the Douglas pouch, section of the utero-rectosacral ligaments, decollement uterovaginorectal. Amputation of the vagina. Then follows iliolumbopelvic cleaning. Dissection and extirpation of the cellular tissues of the pelvis; also of the iliac and lumbar fossæ together with all the vessels and lymphatic glands which they contain.

After completing the lumboiliopelvic "evidement" he removes the forceps which close the vaginal canal and introduces into the pelvis two meshes of sterilized gauze per vaginum. Actually places the ureters over the gauze "*je place actuellement les ureters sous les meches.*" Then follows peritonization. Closure of the pelvis by the pelvic mesocolon and suture of the free border of the mesocolon to the iliac and vesical peritoneum. Abdominal wound closed. Forty-eight hours after the operation the pelvic gauze is removed and replaced by a small mesh which passes into the vaginal canal and which favors the rapid closure of the pelvis by cicatrization of the vaginal orifice. Vaginopelvic irrigations are only made when absolutely necessary. It is first ascertained that the peritoneal dome has healed before irrigations are employed, then sterilized artificial serum is used. He performs the operation in an hour and a half at the most, even in the most complicated cases.

1905.

Koblanck(16) discusses the technic as to the care of the ureters in the abdominal operations for cancer of the uterus. He states that Jonnesco isolates the ureters and later covers them with peritoneum. Mackenrodt and Doederlein carefully dissect away the cancerous tissue from the ureteral sheath and leave the ureter to remain upon its substrata as much as possible. Wertheim pursues a similar technic while Kroenig and Franz dispense with the difficult preparation of the ureter. They resect both ureters and the bladder in to those cases where the cancerous process has invaded the urinary apparatus. Nephrectomy is very seldom done, only when an implantation into the bladder is impossible.

Polosson(17) states that he has carried out the following technic since November, 1904: The cauterization of the cancer

is done as a preparatory measure by an assistant and on same day as the main operation. In cases of cancer of the body of the uterus he simply makes a hermetic suture of cervix with silk. Very steep Trendelenburg position; large median incision extending one or two inches above the umbilicus. A compress of gauze is sutured to the wound margins so as to avoid all contact with the skin. Whenever possible the peritoneum is attached to the abdominal compress by forceps. For the purpose of raising the uterus up he employs a two-prong forceps and with this he grasps the uterus near the corona, seizing at the same time portions of the broad ligaments. Gauze packs hold back the intestines from the operative field. Ligature of the infundibulopelvic and round ligaments by division of same between two clamps which are replaced by ligatures of catgut. The ligatures are placed as far away from the uterus as is possible. Division of the peritoneum between the infundibulopelvic and corresponding round ligament. Dissection of bladder. After freeing it for 2 to 3 cm. the refolding of the peritoneum on the right and left side of the uterus is done. The uterine artery and veins are divided between two forceps. Now comes the search for the ureter near its vesical end on the posterior aspect of the broad ligament. In pursuing the vesical dissection he comes upon the mouths of the ureters by progressing in the median line, he follows the ureter throughout its entire pelvic course. If the ureter is intimately connected with the neoplastic tissue a partial resection may be necessary after which he established a ureterocystoanastomosis, as an incomplete extirpation leads to a recurrence. It is well to pursue the dissection of the bladder 3 to 4 cm. beyond the extent of the cancerous tissue. Having dissected out the ureters he extends the lateral wound close to the pelvic wall. This is done either with the finger or scissors "ciseaux mousses." With the finger he removes the cellular tissue of the broad ligament beyond the neoplastic indurations, but leaves at the side of the pelvis a certain amount of connective or fatty tissue. Lately he removes all the cellular tissue of the broad ligament down to the bladder, and even denudes down to the upper aspect of the levator ani and vaginal wall.

If one proceeds in this manner all of the parametrium is removed *en masse* without tearing and without coming in contact with the uterus and vagina. Laterally and in front the dissection may be carried to the obturator fossa. The posterior fold of the broad ligament has not been touched. Now follows the section

of the posterior fold down to the uterosacral ligaments which are divided near the pelvic wall. The broad and uterosacral ligaments are thus removed with the uterus. The rectum is now dissected from the vagina. Section of the uterosacral ligaments facilitates the removal posteriorly of large masses of cellulofatty tissue which are frequently found to contain cancerous glands and lymphatics. If the neoplastic mass invades the rectal wall, the latter is divided above and closed by suture. "Pincers coudees" are then placed on the vagina as low as is possible so as to close the canal. Two clamps may be applied and the section made between them. An aid or assistant irrigates the portion of the vagina subjacent to the clamps, and a tampon is inserted. In cases where the cervical cancer extends very low it may not be possible to apply the clamps; in that case he opens the vagina as low as is possible.

He then searches for and removes more glands. One can with these incisions explore the external iliac vessels down to the origin of the hypogastric. Hemostasis wherever needed; gauze is then placed in the upper vagina and extended to the right and left to the lowest level of the parametric cavity. The peritoneum is sutured from before backward. In some cases the anterior peritoneum is sutured to the anterior aspect of the rectum. The operation is terminated without any abdominal drainage.

1906.

Latzko(18) states that during the past year he has developed a method of abdominal extirpation of the uterus as follows: After a thorough preparation of the carcinoma median laparotomy is made, and the general abdominal cavity is walled off by sunken compresses; then follows the ligation of the ligamentum infundibulopelvicum. The parietal peritoneum is then split downward along the external iliac artery. Ligature of the ligamentum rotundum which is drawn from the inguinal canal. Blunt dissection is made of the connective tissue of the common iliac artery from its beginning to its opening under Poupart's ligament. The iliac, hypogastric, and deep inguinal glands with their associated lymphatic channels are thus freed from their attachments so as to remain adherent to the uterus by the lymph vessels running along the uterine artery. Frequently the obturator nerve must be dissected free by blunt dissection from the glandular connective tissue of this vascular triangle.

The ileopsoas muscle, the large vessels, the horizontal pubic ramus, and the obturator fascia are now exposed. Ligation of the uterine artery at its root without regard to the inferior vesical artery. The same steps are made on the opposite side. Then follows removal or dissection of the bladder to below the ligamentum interuretericum with freeing of the ureters from their attachments to the parametrium, care being exercised so as to preserve the ureteral sheath. After freeing the rectum then follows the removal of the sacral glands which remain attached to the ligamentum sacrouterinum; these with the parametrium and the parakolpion are then separated into isolated vascular pedicles and are ligated and divided close to the pelvic wall.

The inner genitalia now hang from the vaginal tube. The small pelvis may be surveyed down to the incisura ischiadica; the levator ani lies exposed. Drainage is provided through the labia majora, after the method of Amann. The large pelvic wound, freed of its peritoneum, is covered with two gauze strips. The vagina is now pierced at its deepest point by an aneurysm needle and ligated on both sides. Curved clamps are applied to the vagina toward the cancer after which follows the division of the vagina between the clamps and the ligatures. The two gauze strips are drawn through the inferior angle of the abdominal wound, then closure of the abdominal wound is made. Latzko operated in this manner on ten cases without primary mortality.

Stoeckel(20) described Bumm's operation (see description by Bumm in 1907). Veit(19), after trying various methods, states that he now prepares his patients for the radical abdominal operation by cureting the carcinoma on the evening before the day of operation and covering it with strip of gauze which has been dipped in a 4 per cent. formol solution. This gauze is removed immediately before the operation and the vagina is rubbed with alcohol, then sublimate, and all secretion wiped off. Ten to 20 cm. of Merck-Menzer antistreptococcic serum are injected a few hours before the operation. In some cases the same amount or even a double dose is given after the operation.

He has used stavain spinal anesthesia for this operation since July, 1905, with good results. He now employs Bumm's method of ligating the internal spermatic artery with a transverse lateral division of the peritoneum outward. He occasionally ligated the trunk of the internal iliac artery, at least on one side. Bumm's

method simplifies access for ligation of uterine or internal iliac artery. It also shortens the time of the operation.

1907.

Wertheim.(22) "The technic of the Wertheim operation is as follows: after a careful preliminary treatment of the cancer per vaginam, by scraping and burning it with Paquelin's cautery and after a thorough disinfection, the patient is placed in Trendelenburg's position and the abdominal cavity opened by a median longitudinal incision between the symphysis pubis and umbilicus.

"1. By dividing the posterior layer of the broad ligament the ureters which appear through the peritoneum are exposed up to their entrance into the parametrium. It is necessary to avoid isolating them all around, and their surrounding vascular net work must be spared as much as possible (Fickel, Sampson).

"2. After dividing the peritoneum the bladder must be separated from the uterus.

"3. Then follows the ligation and division of the infundibulopelvic, the broad and round ligaments. The order in which these first three steps follow one another may be varied.

"4. The next step is the ligation and division of the uterine vessels with the surrounding cellular tissue. For this purpose the following manipulation serves: the index-finger of one hand is pushed along the ureter through the parametrium toward the bladder until the tip of the finger appears there; the vessels are then raised on the finger which covers the ureter, so that the ligation and division of the vessels can take place without injury to the ureter. The bleeding from the uterine ends of the vessels is stopped by clamps or ligatures.

"5. As soon as the uterine vessels are divided the vesical portion of the ureters has become easily accessible and the preparation of the ureters can be readily completed. In simpler cases the vesical end of the ureter separates without any difficulty, partly by using the blunt end of finger, partly with a few strokes of the scissors up to its ending in the bladder, and the bladder itself is separated in its deeper part from the tumor and the vagina. If the ureter is fixed, the advantage of the abdominal route is most apparent, as by careful preparation one can separate even firmly fixed ureters from the tumor without any danger to them.

"6. Next follows the separation of the rectum from the vagina.

The isolation of the carcinomatous organ has now been sufficiently effected, and its removal follows.

"7. For this purpose the parametrium is divided as closely as possible to the pelvic wall and

"8. The vagina is cut across. The seventh step can be carried out without any loss of blood by applying to the parametrium, before dividing it, four or five bent clamps on each side, which can be replaced later by ligatures. Before the eighth step is begun the vagina is cleaned out again by dry-wiping with sterile gauze. To avoid infection from the cancer strong clamps are applied to the vagina before its division, so as to isolate the cancer from the vagina which is divided below these clamps. Bleeding from the paravaginal tissue is stopped by stitching round the vaginal stump. The division of the vagina after the preceding application of such clamps is preferable to the procedure at first adopted—namely, extracting the uterus through the vagina, having first loosened it all around—on account of the more effectual control of bleeding by the former method.

"9. For the purpose of extirpating the lymphatic glands in the neighborhood it is necessary to prolong the incision of the peritoneum upward. The great iliac vessels are, as a rule, already bare; if not, a blunt division of the cellular tissue with the finger suffices. Every lymphatic gland at all enlarged in the region of these vessels, up to where the aorta divides and downward as far as the obturator foramen, must be extirpated. Careful checking of bleeding must be undertaken also.

"10. The wound must be treated as follows: The cavity created by the removal of the tumor is filled in loosely with iodoform gauze which extends to the vulva. An exact closing of the peritoneal cavity over this gauze drainage is effected by the sewing up of the anterior and the posterior flaps of the peritoneum. The final step is suture of the abdominal incision in layers."

Bumm(23), after trying various methods of preparing a patient for the abdominal radical operation, has finally adopted an entire circumcision of the vagina at the junction of the middle and lower thirds with the removal of the upper portion in the shape of a bag; this is then sutured over a tampon pressed into the cancer cavity. He makes thorough disinfection of the lower vaginal stump and avoids all preparatory treatment that might weaken the patient, such as streptococcus infection and the like. Pelvic elevation is made with median incision dividing

the abdominal walls from the navel down to the symphysis. In order to separate the bowels from the field of operation he employs 3-meter strips as wide as one's hand and folded several times. To avoid frequent change of hands and to insure rapid progress of the operation he first exposes the uterus on the left and then on the right side down to the base of the ligamentum lata to the opening of the ureters into the bladder, freeing them completely from the vagina; after the division of the serosa of the Douglas pouch the rectum is pushed off, and the vagina perforated beneath its sutured point. The uterus with its adnexæ is then lifted up so that the lateral portions of the ligamentum lata become "taut" and visible down to their insertion into the pelvic wall. These are now radically extirpated.

The extirpation is now begun by a double clamping of the left ovarian vessels laterally to the ovary. Next he splits the peritoneum beginning at the base of the spermatic vessels and making a lateral curved incision anteriorly over the ligamentum rotundum to the middle of the vesicouterine excavation. The lateral end of the round ligament is tied.

By drawing the wound margins of the peritoneum apart one gains a view of the two folds of the broad ligament and in less fat persons there the entire field will be exposed showing the deeper pelvic vessels without the loss of a drop of blood. One sees now the division of the common iliac artery and in this triangle lies a package of glands which extending along the external iliac vein, covering it as far as Poupart's ligament. A few strokes with the tissue forceps suffice to remove the glands with their surrounding fatty tissue from the vessels. This exposes the ext. iliac vein down to Poupart's ligament and also the hypogastric artery to its point of origin from the common trunk of the uterine artery. The uterine vessels running transversely to the latter are then isolated, grasped and ligated. He recommends that the arteria vesical superioris be preserved.

In fat persons the separation of the folds of the broad ligaments shows at first only large masses of fat which will have to be dissected by blunt dissection before the vessels may be reached. Exposure of the ureter without resection of the latter where it is surrounded by carcinomatous masses; resection is fraught with too great danger from infection. Having dissected the ureter out down to the base of the bladder, the uterus is held over to that side and the operation continued on the opposite side in the same manner.

The bladder is pushed loose down to the vaginal point where the vaginal tube had been divided and the preparatory dressing applied. With the uterus drawn symphyseally its posterior wall is made accessible, the peritoneum is then divided transversely over the origin of the folds of Douglas, the peritoneum pushed away until the division of the posterior vaginal wall is reached. Thorough removal of the ligamentum lata. The base of the ligamentæ and the uterus are freed, the diseased side is lifted out, the ureter held to one side and the tumor dissected out by blunt dissection. Bumm has frequently dissected down to the levator ani and to the nerve cords of the ischiadic plexus posteriorly.

After removal of the carcinomatous uterus the stump of the vagina is sutured and a search for bleeding vessels or glands is made. All bleeding points are clamped and ligated. Splitting of the serosa permits an inspection beyond the promontory to the upper parts of the common iliac artery and along the inguinal ring. When a marked contamination with germs is assumed irrigating of the entire wound cavity with 6 to 10 liters of salt solution. The results have been very satisfactory and in some cases striking. Transverse continuous catgut suture unites the wound margins of the serosa of the pelvis. Closure of abdominal wall is followed by loose tampon of vagina with gauze.

Doederlin and Kroenig (24) use the following technic. The vagina is douched with sublimate and sublimate alcohol solutions and tamponed with iodoform gauze to catch all secretions during the operation. The authors do not make any preparation of the carcinoma itself, being of the opinion that such preparation by the curet and cautery disseminates not only the carcinoma cells, but the pathogenic and highly virulent bacteria usually present in the degenerated carcinomatous masses. They think that the technic of Wertheim makes such preliminary preparation unnecessary.

The patient is placed in an extreme Trendelenburg position, the self-retaining abdominal retractor of Doyen or Fritsch being applied. Exploration of the abdomen, with palpation of the uterus, parametria, bladder, lateral pelvic walls, spinal column alongside of great vessels, is then made for lymph gland metastasis. This is done to determine the operability of the case; the uterus is now grasped with a Kustner tumor forceps which does not injure the uterus. The uterus is pulled

first forward and upward. The extirpation is begun after the method of Bumm, ligation of the spermatic vessels, incision through the peritoneum, downward and forward, paralleling the round ligaments, separating the two layers of the broad ligament by blunt dissection; the large vessels, ureter, and any enlarged lymph glands will now be seen. Bumm's procedure greatly simplifies the operation and has the additional advantage of being bloodless. Next comes removal of the lymph glands, ligation of the arteries outside of the ureter, and dissection of the ureter. The operation now continues "a la Wertheim," the peritoneum is separated from the bladder and rectum, and the separation is carried downward to the middle of the vagina; if the bladder is involved a resection of the affected portion of the bladder wall is made, and both sacrouterine ligaments are severed. The uterus now hangs free—only by the vagina. The gauze is now removed from the vagina which is again cleansed by sponging, the right-angled Wertheim clamps applied, and the vagina cut across. The authors use Shoemaker's ligature forceps for applying deep ligatures in the pelvis.

The closure of the operation field is accomplished by uniting the rectal peritoneum to the posterior vaginal wall, the anterior or cervical peritoneum to the anterior vaginal wall, so as to obliterate dead spaces. If the operation has been extensive, drainage is carried out after the method of Amann, that is though the cavum ischiorectale, and made to emerge to the side of the labia majora. If the operation has not been so extensive, the lateral cavities are simply covered with peritoneum by a continuous catgut suture. Lastly, the anterior and posterior walls of the vagina are sutured together.

Veit(25) states that he uses spinal anesthesia in this operation with better results as his experience widens. Heretofore the extension of the operation worried him less than did the anesthesia.

1908.

Amann(26) states that in order to perform the typical radical abdominal operation for cancer of the uterus the progress should be by broad separation of the peritoneum from without inward, the lymph glands with their channels should be separated from the large vessels, and then the uterus with its ligamentous attachments freed from its surroundings and removed. He is of the opinion that a little drainage corresponding to the deepest

point in the small pelvis is indicated. The technic of pelvic drainage is closely associated with the form of ureter covering: on the one hand the cavities are to be drained, on the other the ureters are to be surrounded by the adjacent wound surfaces and supplied with nutriment. A gauze strip should by no means come in contact with a ureter, else necrosis will occur.

Six years ago he recommended that the vagina should be closed above, the bladder drawn backward and resting on the rectum, the ureters placed alongside the rectum and covered with the bladder, then the large lateral wound cavities drained paravaginally by incisions alongside the introitus vaginæ. Lately he modified the method to one that is easier and which has been successful in a large number of cases. The bladder peritoneum is sutured to the anterior vaginal wall with a continuous catgut suture; the lowermost portions of the ureters are literally wrapped into the bladder wall by several button sutures which lift up the deep posterior parts of the bladder wall and unite it with the peritoneum of the bladder. The upper portion of the ureter (free portion) now sinks deep into the wound cavity of the small pelvis. In order to elevate the ureters and at the same time fix them outwardly to the lateral pelvic wall he unites the stump of the uterine artery underneath the ureter with the slightly drawn downward lateral peritoneum, so that the ureter seems to ride on a sort of fork formed by the uterine artery and the hypogastric artery and without pressure lifts it out of the deep small pelvis, fixing it to the lateral pelvic wall. The ureter thus lies on the lateral pelvic wall aside or on the arteria vesical superior, which he always tries to save, and is completely covered by the superimposed peritoneum. Therefore it is impossible for them to come in contact with any drains in the small pelvis.

In order to drain the deep pelvic cavities effectively he grasps the posterior vaginal wall with two clamps and pushes the rectum by dull dissection away from the vaginal wall for some distance downward; then he splits the posterior vaginal wall with the cutting thermocautery between the clamps in longitudinal direction down to the niveau of the lateral wound cavities (Wundbuchten). Through this slit iodoform gauze, which has been introduced by a guiding sound from above into the vagina and carried out through the vulva, may be pushed in front of the rectum and also a little laterally.

The lateral peritoneal slits are then closed in such a manner that the posterior peritoneal flap next to the rectum is sutured to the peritoneum which has been drawn to the uterine stump; thus, the peritoneum again rests against the lateral pelvic wall and in the depths the vaginal lumen will appear open through which the iodoform gauze, through which the longitudinal incision of the posterior vaginal wall extends somewhat posteriorly, protrudes.

This deepest portion of the small pelvis, now laterally covered with peritoneum perfectly, is now closed by suturing over it the sigmoid flexure and if this should prove insufficient also the downwardly displaced cecum, closing it completely from the other abdominal cavity. The flexure is sutured to the lateral and to the bladder peritoneum with button sutures. He states that for the past twelve years he has utilized the flexure, also cecum and bladder, in the most extensive manner for the covering of peritoneal defects in the small pelvis and has always been very successful. This method is to be employed only in the extensive cleaning out of the pelvic cavity. Has had no ureteral fistula for years when using this method. Fixation to well nourished tissue is most important for bladder and ureters and the conservation of the nourishing bloodvessels is also essential.

Seeligmann(27), in six very severe recent operations for cancer of the cervix, had occasion to modify Wertheim's operation as follows: One or two days before operation, depending largely on the condition of the patient, under morphia-scopolamin injection or under ether the cancer is cureted and the cavity packed with a tampon of vioform gauze which has been wrung out of 5 per cent. formalin solution. The entire cavity, the uterus, and vagina are packed. This gauze is removed before beginning the operation and the vagina and cavity cleansed with sublimate solution; thereupon the vagina and uterus are carefully dried and a sterilized vioform gauze bandage introduced, filling the uterus and vagina and protruding from the latter. He then disinfects the abdomen with soap, alcohol, and sublimate. After incision in the median line he covers the large abdominal cavity from the operative field by a large operating cloth or sheet, drawing it well over the margins of the abdominal wall, thus avoiding further contact with the intestines. He incises the peritoneum as Bumm does, as by so doing the two ureters are easily exposed. "Ich präpariere den Ureter nicht." He

does not dissect the ureter but follows it along its course through the small pelvis into the bladder. He then finds the large vessels and exposes the uterine artery and vein at their communications with the trunk vessels. Both are ligated and, with the ureter, the hypogastric artery and vein are pushed outward as far as possible against the pelvic wall. An assistant now draws the uterus upward and to the left out of the abdominal cavity as far as possible and ligatures (two strong silk sutures) are placed around the tense ligamentum sacrouterina and around the base of the parametrium on the right and then on the left side as close to the pelvic wall as possible; they are then divided. Having sought for glands and removed them he tampons both pelvic cavities and has an assistant draw the uterus upward and backward causing the vagina to become tense. Dull dissection of the vagina is made from its attachments, so that the thumb and index-finger of the left hand encircle a large portion of the upper part of the vagina and compression can be made on the previously introduced vioform gauze. He then severs the vagina from right to left without previously applying any angular clamps. He now attaches fresh vioform gauze to the gauze exposed in the free or divided vaginal tube and draws it out per vaginam establishing the necessary drainage. The drain is placed on the vaginal tube which has been modified by two lateral sutures and pushed slightly against the pelvic cavities. Over this the peritoneum is sutured with continuous and button sutures from right to left. Uses no clamps and has had excellent results.

Clark(28) states that the rule he now adheres to is "to remove all tissue possible in the vicinity of the primary site of the growth, using the cautery rather than the knife. In general, the principles laid down by Wertheim's latest publication are followed, stopping short, however, with the removal of a considerable cuff of vagina with the uterus, this with as much parametrium as is possible, and not prolonging the operation by a search for glands."

Ries(29) still carries out his operation as first reported in 1895; prepares his patients by curet and cautery and insists on a most radical removal of all lymphatics and other diseased tissue.

1909.

Jacobson(30). From the foregoing review of the literature the author has adopted the following technic, the method being a combination of Bier's spinal anesthesia with Bumm's modifi-

cation of the Wertheim technic in which the vaginal vault is left open and early postoperative x-ray treatment instituted. Spinal anesthesia is especially adapted for this operation. When it is employed the abdominal muscles are temporarily paralyzed and are extremely relaxed. As soon as the incision is made and the pelvis of the patient elevated the intestines gravitate away from the field of operation in a most striking manner. Thus, the parts to be operated are rendered accessible and manipulation of the small intestines is reduced to a minimum. Spinal anesthesia also materially shortens the time of operation and permits of a more accurate hemostasis, preventing in this wise to a great extent the danger of secondary hemorrhage.

To me the most important feature of spinal anesthesia is the prevention of shock by "blocking" of the cord. Thus the afferent impulses or sensations produced by the operation cannot be referred to the peripheral vasomotor centers and nerves and so produce shock. The same state of affairs prevails as it does in Crile's method of "nerve blocking" in amputations of the thigh, only it exists on a larger scale.

The operation is carried out as follows: the patient is given 1/6 gr. of morphine with 1/100 gr. of scopolamin hypodermically about half an hour before the operation. In some cases an additional dose is given about half an hour before operating. The patient sits upon the lower end of the operating-table with her arms folded and resting on her thighs, with the back and spine made convex. The entire skin of the lumbar region is then rendered aseptic and painted with tincture of iodine.

A Record syringe of 10 c.c. capacity, with the regulation Bier needles, which have been prepared by boiling, are used for the injection. One c.c. of a 5 per cent. solution of tropacocaine in 0.6 per cent. solution is drawn into the syringe. The spinal puncture is then made by inserting the needle between the third and fourth lumbar vertebræ, the cannula being withdrawn and about 10 or 12 c.c. of cerebrospinal fluid being allowed to flow out. The syringe is now attached to the needle, the piston withdrawn and the 1 c.c. of anesthesia solution is diluted with the cerebrospinal fluid up to about 10 c.c. The entire contents of the syringe is now slowly injected and the needle withdrawn. The puncture is sealed with colodion, and the head of the table is lowered about six inches for a few minutes.

While waiting for the anesthetic to take effect, which occurs in from three to five minutes, the patient is placed in the lithotomy

position and the vaginal preparation is finished. The extremities and abdomen as high as the ensiform cartilage in the meantime will have become anesthetized. After rendering the vagina aseptic the carcinomatous mass is curetted away and thoroughly cauterized with the Paquelin. The uterus is then lightly packed with gauze, the patient placed in the horizontal position and the final abdominal preparation made. The head of the table is now lowered until an exaggerated Trendelenburg position is obtained. A median incision from the pubes to the umbilicus is made and the abdominal cavity opened. As the abdominal walls are relaxed and paralyzed the intestines quickly gravitate toward the diaphragm; they are then covered and held in this position by very hot gauze packs. A self-retaining abdominal retractor is now placed in position, which greatly facilitates the subsequent work. My own retractor was originally designed for this special purpose (*Surgery, Gynecology and Obstetrics*, October, 1907, pages 447, 448).

The fundus of the uterus is grasped by a double tenaculum, care being taken not to squeeze or compress the uterus with this instrument. The infundibulopelvic ligaments, including the ovarian vessels, are first ligated on either side. Bumm's incision for quickly locating the ureters is made, first on the right side, running outward and forward between the round ligament and the Fallopian tube. This incision goes through the peritoneum and the cellular tissue. The latter is separated by blunt dissection down to the ureter. As this incision crosses the ureter at right angles one can hardly avoid finding that organ immediately. The uterine vessels and any enlarged glands can be seen or felt at this stage of the operation, the glands are removed and the artery ligated. The same procedure is carried out on the left side, the Fallopian tubes and ovaries being removed with the uterus. Bumm's method of finding the ureters is much better than Wertheim's, the ureters being found more quickly and the operation is thereby shortened and shock lessened.

The peritoneum covering the bladder and uterus is next incised and the bladder pushed downward with dry gauze dissection. The uterus and its appendages now are quite free and may be pulled upward well into the incision to facilitate the next most important steps in the operation. On the right side the ureter is dissected upward as far as the bifurcation of the common iliac vessels and downward to its entrance into the

bladder, care being taken not to disturb its posterior attachments too much. Enlarged glands are removed as they are encountered. The uterine vessels on the right side are now tied to the outer side of the ureter close to the pelvic wall. The same steps are now carried out on the left side.

As much of the cellular tissue of the pelvis as possible is removed, cutting far away from the disease. This is accomplished on both sides, cutting down to the sides of the vagina. This step is made with care, for often the diseased tissues are so friable as to cause an unintentional opening into the vagina or uterus. Great care must be exercised in keeping wide of the disease and in cutting through healthy tissue only. When the uterus hangs only by the vagina the Wertheim's right-angled clamps are applied and the vagina severed distally to the clamps. About one or two inches of the vagina are thus removed. These clamps effectually prevent contamination of the wound by the secretions of the infected carcinomatous uterus. Some bleeding is usually encountered from the vaginal arteries, but this is as a rule not troublesome if the uterine vessels have been secured.

The final steps of the operation consist in arresting of all hemorrhage, the further removal of any suspicious looking tissue, the covering of all raw surfaces with peritoneum, and the placing of three or four large rubber tubes (one-half inch) in the vaginal opening for drainage; these serve also to keep the vagina open for the subsequent Roentgen treatment. This description briefly represents the normal type of operation. It is, of course, varied to suit individual cases. Involvement of the bladder or ureter can be dealt with by the recognized standard procedures. The postoperative x-ray treatment is begun as early as is possible after the operation. This is commenced as early as the third day, and is carried out in a most aseptic manner by an expert Roentgenologist.

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DISCUSSION.

DR. WM. H. HUMISTON, of Cleveland, Ohio, stated that the German physicians had, through a commission, distributed literature to the laity on the early symptoms and diagnosis of cancer, especially cancer of the uterus, and this would have undoubtedly a very decided effect in bringing these cases early to the surgeon for radical operation. It was wonderful what the so-called radical operation that had been put forth by Wertheim had done in these so-called inoperable cases. It was his pleasure to have been with Wertheim for several weeks in 1905, at which

time he saw him operate upon numerous cases of so-called inoperable carcinoma that had been referred to him by general surgeons of noted ability that they thought could not be relieved or cured by operative measures. All but one of these cases were operated upon, and he saw anywhere from 20 to 25 of these operations that were done under spinal anesthesia. The preparation, the field of operation, etc., was all made before the final anesthesia was induced, and the operation was then performed, a wide dissection being made, not only removing the broad ligaments, but the glands from the upper part of the vagina and the cervix, this, together with the separation of the uterus and the vagina from the rectum posteriorly, separation of the bladder anteriorly, clamping off and taking off from one-third to one-half of the vagina, making a clean operation, giving excellent results. The statistics of Wertheim in these so-called cases of inoperable carcinoma of the cervix and uterus were as favorable as the older method of early operation in such cases. It had been the speaker's good fortune to have had but few cases of this kind that he could induce to submit to operation. Three were still living. In these he resorted to wide dissection.

DR. RALPH WALDO, of New York, stated that every civilized nation had one or more cancer commissions, and they had made no advance up to date in the etiology of cancer. They were collecting a mass of statistics, and it was hoped some time that they would know something more positive about it. There had been, however, a decided advance in the operative work for cancer, and especially cancer of the uterus. He believed to-day that most anyone who was competent to pass judgment would advise a radical operation on any woman forty-five or fifty years of age who had a persistent hemorrhage from her uterus unless there was some little polypus or something of that kind which he could thoroughly demonstrate to be the cause of the hemorrhage. One would occasionally take out a uterus at that age which was not the seat of carcinoma, but he would take out many more uteri which were the seat of incipient carcinoma.

The essayists had spoken about the methods of operating. He would admit that occasionally there was a case where the abdominal operation was necessary. He had one such case this last winter where a nullipara had this hemorrhage to which reference has been made. On making the ordinary vaginal examination the cervix was found to fill nearly the whole pelvis, the vagina was small, and he operated, removing this offending organ from above. On the other hand, he would not admit that in ordinary cases the vaginal route was not preferable. He considered it decidedly preferable. When he said the vaginal route he did not mean the ordinary everyday vaginal hysterectomy, but meant hysterectomy which opened the anterior vaginal wall up to within one-half to three-quarters of an inch of the meatus pushing off the bladder and exposing the entire pelvis, as one could do, and the tubes and ovaries as well much better than through the average abdominal incision.

DR. MAURICE I. ROSENTHAL, of Fort Wayne, Indiana, said the early symptoms of cancer of the uterus were hemorrhage and discharge, and these were late evidences of the disease. When the surgeon got a case of cancer of the uterus in its early history it was a pure accident. The only saving clause was the fact that some carcinoma were less malignant than others, or some were more malignant than others, and when we were dealing with a carcinoma of the fundus of the uterus we were ordinarily dealing with a less malignant form of the disease. A destructive operation in the vagina in such a case was altogether uncalled for. When one was dealing with a carcinoma of the portio vaginalis he was again dealing with that form of carcinoma which was like an epithelioma about the lip, and it was not so malignant. In these cases the ordinary hysterectomy done with the cautery would give as good results as any other operation. When one was dealing with carcinoma of the portio uteri, a carcinoma which began in the endometrium higher up, he was dealing with a serious malignant disease that practically no operation would do any good. In such cases a broad and deep operation might be of some avail. He had done the Wertheim operation. He had reported fifty-seven cases some years ago in which he had resorted to this operation with good results in that class of patients. But he did not believe it was necessary to subject every woman to a radical Wertheim operation to the rejection of a less severe operation in the less severe cases of cancer.

DR. J. H. CARSTENS, of Detroit, Michigan, agreed with what Dr. Rosenthal and Dr. Waldo had said. It was a question of early diagnosis. In a case of cancer in which the disease involved the lymphatics and extended beneath the diaphragm, involving the kidneys, etc., very little could be done with the Wertheim operation or by any other operation, and when the patient was so far gone as that it was better to let her alone and trust to the *vis medicatrix naturæ*. As a rule, the older the patient, the less malignant the disease; the slower the growth, the more likely one was to afford relief. He operated on one patient, twenty-two years old, four years ago, for a severe hemorrhage. She had simply a benign adenoma of the uterus. He thoroughly curetted it. The woman was well for a while, but began to flow again and this continued for four years. Her attending physician had given her medicines of all kinds, but she finally came back to the speaker. He curetted her again, examined the scrapings, and found it was adenocarcinoma, and immediately had her taken back to the hospital, and within a short time her uterus was removed with the cautery. The point he desired to make was to get these cases early, make an early diagnosis, and operate promptly.

DR. THOMAS B. NOBLE, of Indianapolis, looked upon cancer of the cervix or of the uterus as an analogue to carcinoma of the breast. It should be so considered and diagnosticated, and

decidedly so as regards treatment. The time was when surgeons simply removed the tumor from the breast, ultimately the breast, then the contiguous lymph nodes, and now everything was removed. He believed that such a procedure was coming with reference to the treatment of cancer of the uterus. He was unable to do a complete and thorough widespread operation by the vaginal route. The farther the surgeon went from the infected area, the more nearly he could eradicate the disease. This was what was done with malignant disease anywhere to-day. It was the aim of the surgeon to take away as much of the tissue as possible, hoping by so doing he would remove all of the infected area. The same was true with reference to carcinoma of the uterus. The field must be thoroughly exposed, and in doing an extensive operation for the removal of carcinoma of the uterus the abdominal route was the preferable one.

DR. JOSEPH PRICE, of Philadelphia, said that cancer of the uterus was a loathsome and distressing disease. Many years ago Oliver Wendell Holmes invited Sims to lecture to his anatomical class, and Sims selected for his subject the curet and cautery. The great Sims recognized that the curet and cautery gave these women a period of one or two or more years in which there was an absence of offensive discharges, copious hemorrhages, and freedom from pain. Unquestionably the use of the curet and cautery for the removal of the involved structures had prolonged the lives of these sufferers for one or two years. If we would take the neglected, the delayed, or hopeless patients, and resort to the curet and cautery, particularly if the parts were thoroughly cooked, these women would be put in a new atmosphere. It was the sisters, daughters, and husbands and others who appealed for early operation on these cases because they were living in a contaminated atmosphere. By operating on these cancer patients there was freedom from this contaminated atmosphere for at least two years. What happened in those cases in which extirpation had been resorted to? There was recurrence of the trouble in bowel and bladder and other viscera, and these recurrences came as quickly as they did from the use of the curet and cautery, when well done.

DR. FRANCIS REDER, of St. Louis, Missouri, stated that so far as operative measures were concerned for cancer of the uterus, the whole thing resolved itself into early diagnosis, skilled operative measures, and the education of the patients. Unquestionably education of the patient was the essential feature to lower the mortality in cases of cancer of the uterus. At present he had under his observation eighteen cases that he considered operable, and in approaching these patients with an operation they had asked him if the operation would stop their menses. He told them yes, and they had replied it was God's will and they did not wish to be operated on. Such people he thought should be educated. There were a great many ignorant people who were willing to be educated along this line, and the

points that had been mentioned must be brought to the attention of patients, particularly with relation to cancer, and all conditions that are abnormal about the genitalia of women. Literature regarding the dangers of cancer should be freely circulated. Dr. Winter had done this in Europe with the consent of the Government and the speaker understood that he was allowed now to go ahead and operate without obtaining the consent of patients, and by so doing had succeeded in lowering the mortality about one-half. In America this could not be done because physicians did not have the protection of the Government.

DR. EDWARD J. ILL, of Newark, New Jersey, referred to the hereditary possibilities of cancer, and spoke of the dissemination of cancer by cancer particles from the patient. Dr. Waldo has spoken of splitting up the vagina and removing the mass as a whole. No one could open up so much cellular tissue without spreading the malignant disease all through. In fact, the safest operation, where there was any extent of cervical carcinoma, was to start from above, separate all adhesions, separate all attachments of the uterus to its surroundings, and then go in from below and lift it right out, cutting it off with a cautery after the manner suggested by Werder years ago. There were probably fewer immediate infective cases from that source than from exposing a large amount of cellular tissue.

DR. CHASE, in closing the discussion on his part, said he pointed out in his paper that there were two unsolved problems, and when it came to the question of uterine cancer they were of great importance. The first one was this: What was the effect of heat on the proliferation of cancer cells? Does the effect of heat destroy the cancer cells, or does it not? When one brought the cautery in contact with the diseased surfaces it heated the structures beyond those which were decomposed by the heat. What influence had this on the cancer cells remaining? Did it destroy them, or what was the result of the heat? The other point in these cases was that where we had devitalized tissue and destroyed tissue, what happened in such cases? When we devitalized tissues absolutely there was a breaking-down and we got a new granular surface, and with the cautery we could reach the healthy tissue, and then we could get healing if we were fortunate to reach the tissues. The heat simply cooked the part or parts, which was very important. Where these tissues are thoroughly cooked, apparently thereafter they do not break down, but slow absorption took place, and following this there was a deposit of healthy lymph and a reconstruction of tissue.

The use of the thermocautery undoubtedly inhibited cell growth.

DIAGNOSIS OF TUBAL ABORTION AND RUPTURE.¹

BY

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It was formerly held that the common termination of a tubal pregnancy was by rupture. Indeed, tubal abortion was first described by Werth as late as 1887. Schrenck, in 1892, noted abortion only eight times in 610 cases collected from the literature. On the other hand, in 289 cases reported by Martin, Orthmann, Mandel, and Schmidt, Fehling and Gletsch, 78 per cent. ended by abortion and 22 per cent. by rupture. Martin, therefore, considers tubal abortion to be the rule (see William's article in Kelly and Noble's "Gynecology and Abdominal Surgery").

My own impression is that rupture is more frequent but it must be confessed that, in the early work, inspection was not carefully practised nor with the same scientific basis, since it was taken for granted that the embryo was discharged into the abdominal cavity in practically all cases except those in which it entered the broad ligament.

Some writers would lead one to believe that the differential diagnosis between tubal abortion and rupture is easy and that one should operate only on cases of rupture. A little reflection, however, will convince one that the differentiation between these conditions, even with the abdomen open, depends largely on the personal equation. Theoretically, we may distinguish sharply between a rupture of the tubal wall with open vessels and the expulsion of the embryo through the free end of the Fallopian tube—the former a menace to life, the other resulting merely in the presence of sterile absorbable organic material. Practically, tubal abortion is by no means a simple extrusion through a dilatable orifice. As in the case of ordinary uterine abortion, it is frequently accompanied by massive hemorrhage, a statement based on actual personal experience. Conversely, I have operated on cases in which the embryo had escaped

¹ Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists held at Syracuse, September 20-22, 1910.

through a tube ruptured at a distance from the fimbriated extremity, but with comparatively little hemorrhage.

Thus, while it is interesting from the pathologic standpoint to discriminate between tubal abortion and rupture, it should clearly be recognized 1. that statistics as to the relative frequency of these conditions, based on inspection at operation, often necessarily made hastily, cannot be accurate; 2. that differential diagnosis prior to operation is impossible; 3. that even if the differentiation could be made, it would not be a safe criterion of the advisability or inadvisability of operative interference. Practically, the main points to determine are the presence or absence of an appreciable hemorrhage into the abdomen and its source. Hence no attempt will be made in the further discussion to distinguish between tubal abortion and rupture.

The signs and symptoms of tubal pregnancy may be divided into three periods—namely, before, at the time of, and after the displacement of the embryo from the tube. A great many papers have been written on this subject but, unfortunately, too many authors have discussed it from an academic standpoint and have made statements based on inadequate *a priori* premises, which subsequent experience has shown to be incorrect. There may be mentioned, for instance, the dictum that some inflammatory change, especially gonococcic infection, predisposed to tubal pregnancy by robbing the tube of its cilia, whereas, in my experience, a fairly normal condition of the tube seems prerequisite to the development of the ovum within it. With more direct reference to diagnosis may be cited the former teaching that tubal abortion was extremely rare, and the present swing of the pendulum to the opposite extreme with the attempt to exclude abortive cases from the category of those requiring operative interference. Every operator knows that the great majority of cases reach him with the diagnosis incorrectly made. This fact is due, I believe, not to the incompetence of the general practitioner but to the faulty and unpractical teaching which he has received from supposed experts.

The diagnosis may be somewhat simplified by keeping clearly in mind certain general principles. For practical purposes we may consider ectopic pregnancy as always tubal. Ovarian pregnancy was not positively demonstrated until the case of Dr. Katharine Van Tussenbroeck, of Amsterdam, in 1899, Auning and Littlewood confirming her report in 1901 by a specimen presented to the London Obstetric Society. Since

then a very few other indubitable cases have been encountered. The interstitial type either becomes a uterine pregnancy or it has the same tendencies and requires the same management at tubal pregnancy.

It is conceded that the great majority of cases of tubal pregnancy rupture or abort by the twelfth or fourteenth week, thus pretty definitely limiting the first period and often enabling us to make a very simple exclusive diagnosis. Rupture occurs, on the average, earlier than abortion. Rupture may be sudden or gradual, complete or incomplete. When sudden it is practically instantaneous. The term complete indicates the discharge of the entire embryo, including the placenta. The term incomplete means not that the rupture has not penetrated the walls of the tube, but that all or some parts of the products of conception remain inside. The same general principles of classification apply also to tubal abortion as well as to ordinary uterine abortion.

Rupture may take place either into the abdominal cavity or into the broad ligament. The former is the more common and the more dangerous form. After rupture into the broad ligament there may be a secondary rupture into the abdominal cavity, constituting the so-called abdominal pregnancy, or, if no such secondary rupture occurs, an entirely different group of cases is developed from those requiring emergent diagnosis and immediate surgical intervention—namely, the group of ectopic gestation continuing to the viability of the fetus, of lithopedion, of suppurating cysts discharging into the bladder, bowel, and the like.

DIAGNOSIS PRIOR TO RUPTURE.

It is a truism that the diagnosis of ectopic pregnancy in the first period is included in the diagnosis of pregnancy in general and, with rare exceptions, covers the first three or three and a half lunar months, when the greatest diagnostic difficulties are encountered. As Sutton and Giles ("Diseases of Women") have shown from a careful analysis of a large series of cases, ectopic gestation is most apt to occur in women who have been childless for a number of years but, contrary to the prevailing opinion, it is not especially likely to occur in those with serious tubal disease or, indeed, in those who have had serious pelvic diseases of any kind. Hence it develops par excellence in women least

likely to be under gynecologic observation to pay attention to warning symptoms or even to remember the dates of their menstruation. Mammary signs, uterine enlargement, morning sickness, discoloration of vulva and vagina, softening of the cervix, thyroid swelling, skipping of menses, severally or combined, though liable to fallacies in both directions, are very significant in young women just beginning their sexual life but, for one reason or another, less significant and more apt to be misleading in the class of cases under discussion.

Even when the various signs and symptoms of pregnancy are fairly clear it is often impossible, especially in parous women, to determine whether the uterus does or does not contain the ovum; at an early stage of pregnancy and, while the disclosure by bimanual palpitation of a sensitive and swollen tube would naturally suggest ectopic pregnancy, even this condition may be misleading, as has often been demonstrated by operation. Indeed, I believe that the diagnosis of ectopic gestation, when made in what was supposed to be the first stage, has usually proved to be erroneous, operation disclosing some inflammatory condition of the tube or ovary, an ovarian cyst or fibroid tumor with twisted pedicle, appendicitis, or even a normal gravid uterus with no obvious explanation of the symptoms leading to the diagnosis of ectopic gestation.

Bazy (*Rev. de Gyn.*, Paris, July, 1910) mentions a condition which may still further complicate the diagnosis. This condition he terms hemorrhagic pachysalpingitis and cites three positive and two somewhat doubtful cases. One of his observations is appropriate to what has been said regarding the incorrectness of the old view that some form of salpingitis predisposed to tubal pregnancy, though it cannot be claimed to be more than suggestive. One of his cases of hemorrhagic salpingitis was found to be complicated with tubal pregnancy involving the opposite and otherwise normal tube.

DIAGNOSIS AT THE TIME OF RUPTURE.

The second stage is marked by pain which is characteristic to the degree that its absence would pretty positively exclude extrusion of the embryo either by rupture or tubal abortion, and that the pain is usually sudden and severe. But, unfortunately, so far as can be judged from the statements of patients, the pain is of the same character and subject to the same varia-

tions as in all sorts of other abdominal conditions, such as various tumors with twisted pedicle, inflammatory conditions of the pelvic organs, appendix and biliary passages, troublesome hernia of various kinds, and the like.

Uterine hemorrhage approximating in amount that from an ordinary three months' abortion and appearing within twenty-four hours after the critical pain is also diagnostic to the same degree and with the further qualification that both pain and uterine flow are compatible with an ordinary uterine abortion. While ectopic gestation is necessarily accompanied by the formation of a uterine decidua, that is not necessarily spontaneously discharged, and, on the other hand, it may be discharged and may escape from the vagina and be thrown away very early, so that its absence does not warrant us excluding ectopic gestation, though, if found, it obviously constitutes fairly conclusive evidence of pregnancy somewhere.

Pain and hemorrhage are absent in about 6 per cent. of cases of ruptured or aborted tubal pregnancy.

With the greater or less aid of diagnostic signs and symptoms of pregnancy in general, or of rather unreliable signs pointing to ectopic pregnancy in particular, the diagnosis of tubal abortion or rupture must depend upon the sudden onset of pain, collapse, characteristic symptoms of internal hemorrhage which, as stated, may not be present, the appearance of uterine hemorrhage within twenty-four hours and absence of the embryo and the presence of a decidua in the uterine discharge subject to the negative qualifications just stated.

To illustrate the diagnostic importance of uterine hemorrhage within the time-limit of twenty-four hours the following case is cited:

Mrs. H., aged thirty-one, born in U. S., German, married eleven years, never pregnant. Two years ago had a flow for a few days more than normal, but at a regular menstrual period. She was not examined but "took medicine" for a couple of days and has had no further trouble until the present. She never even had pain during menstruation and the menses were regular and normal in every way.

Saturday, August 6, while on a boat she became indisposed. In stepping off the boat she felt very severe, sudden pain and collapsed. She received no medical attention at the time, but ordinary restoratives were administered and she was taken home as soon as possible and was put to bed. Immediately

she felt so comfortable that it was considered unnecessary to summon a physician, but on account of a rather vague persistent distress one was called on the following Thursday, August 11. On examination he found a distended, swollen abdomen, the uterus about normally placed, but a mass to the left extending down into the culdesac. She was not flowing at this time. He was convinced that it was a case of ectopic pregnancy with rupture and brought her to the hospital the following day. At this time there was quite a copious, dark uterine hemorrhage without clots. The abdominal distention, sensitiveness, and pain had markedly increased. The temperature and pulse were moderately elevated 100.4 and 110, respectively. On account of the delay in the uterine flow and the normal position of the uterus I was convinced that the case was not one of ectopic gestation, but a tumor, either ovarian or fibroid of the uterus, with a twisted pedicle. The suddenness of onset would practically exclude the various inflammatory conditions mentioned. The tenderness was too diffuse for appendicitis or any analogous focal lesion. On operation the case proved to be one of ovarian cyst with twisted pedicle. The subsequent progress was uneventful.

In contrast to the foregoing, the following case of ruptured tubal pregnancy may be cited:

Mrs. L., aged nineteen, mother of one child, two miscarriages prior to the immediate case history. A little more than seven weeks previously she passed a few days over the menstrual period and, not wishing to continue the pregnancy, she visited some one who passed instruments and a few days later she had pain and began to flow. At the end of a week of continuous flowing she was cureted. Then, for about five weeks longer, she was treated for pelvic inflammation. This brings the history down to April 15, 1910, when she summoned Dr. Hugh S. Townsend who immediately called me in consultation. Clots could be palpated in the culdesac and this sign, in connection with the history, led to the diagnosis of ectopic pregnancy, while the lack of violent symptoms, in accordance with the rules for differentiation laid down by some authorities, favored the differential diagnosis of tubal abortion. The culdesac was opened, the clots were removed, and a gauze drain was inserted. During the following night the patient had terrific pain, requiring several hypodermics of morphine. There was also a profuse hemorrhage. The next morning I opened the abdomen, found the

right tube ruptured at the isthmus, and blood issuing from the site of rupture. The tube was removed, the toilet made, and the patient made a perfect recovery.

Obviously, in many instances, a positive diagnosis cannot be made, but, from the practical standpoint, we must be content with probabilities sufficient to lead to prompt operation. As stated and illustrated by the case just cited, I do not believe that it is possible to distinguish between tubal abortion and rupture, nor to locate at all exactly the site of rupture.

It is also inevitable that, when rupture occurs early, with a small ovum, relatively undeveloped bloodvessels in the wall of the tube, or when the ovum is extruded through a patulous ampulla, diagnostic symptoms may be lacking. The patient will believe that she has taken cold or that an early uterine abortion is in progress or merely that she is having a somewhat painful menstruation. Doubtless many such cases pass without operation and, the internal hemorrhage not being of serious amount, complete abortion occurs. It is important, however, that the general practitioner, who is most apt to see such cases at the critical period, should have in mind the possibilities and should either demand operation as a precautionary measure or, at least, should carefully watch the further progress in order to guard against the danger of an undetected dribbling hemorrhage or a subsequent exacerbation. Sometimes the patient does not call a physician at all or only after the lapse of days or even weeks when, with the vague history due to inadequate opportunities for observation, still further delay ensues before radical relief is afforded.

DIGANOSIS AFTER RUPTURE OR TUBAL ABORTION.

As already intimated, the history, while by no means to be neglected, may be vague and, in most cases, it has not the significance in many details formerly ascribed.

With the accumulation of blood in the abdomen, the hemorrhage being usually rather gradual, the uterus, unless held in place by adhesions due to a new growth or to a previous inflammatory condition, is lifted bodily upward and forward until, in some cases, the examining finger must pass around the symphysis to find the cervix. I know of no other condition with a comparable history and course which causes this condition. So long as the blood remains liquid nothing can be felt in the cul-

desac, but after clots have formed a palpable mass is encountered and the vagina may be nearly obliterated. I have noticed this condition as early as forty-eight hours after the critical pain, but in the case of a slow, dribbling hemorrhage it may be postponed even for two or three weeks.

From reading the literature I am convinced that some authors fail to recognize the importance of a clear distinction of stages as already laid down. For instance, one writer states that twenty-nine out of thirty cases present symptoms by which a presumptive diagnosis may be made prior to the patient's arriving at a crisis which is alarming. This expression ought to indicate the occurrence of rupture or tubal abortion. Yet, a little farther on in the same paper, he says "I do not believe that I have ever chanced to examine bimanually a pregnant tube before any symptoms of the tragic stage have manifested themselves."

Similarly, another author claims that 95 per cent. of cases should be diagnosticated before rupture and then cites cases under the heading "before rupture" in which he has operated immediately after the appearance of pain, shock, and the like, and has found the abdomen filled with blood. Obviously, he has failed to distinguish sharply between the stages.

I scarcely need emphasize the fact that the third stage should be anticipated by prompt operation so that, whether the process involves the wall of the tube or the ampulla, the repetition of hemorrhage and the increasing danger of laceration of the tube should be prevented. Here we have a very practical reason for distinguishing between a second stage immediately at or closely following the extrusion or attempt at extrusion of the embryo and a third stage following this process by an appreciable interval. Obviously, the greater the abdominal hemorrhage the longer will the lessened blood pressure delay the appearance of the uterine flow. So, too, the more diffusely the intraabdominal blood is spread over and between the coils of intestine, the less will be the chance of palpating clots in the culdesac. Hence, while theoretically the second stage might be considered to occupy a mere point of time, the distinction of stages as described is important both diagnostically and from the vitally important standpoint of prophylaxis of comparatively late developments. Hematocele, when diffuse or solitary, is a favorable termination of ectopic pregnancy for, even if left alone, it is gradually absorbed, and complete recovery results. Thorn, for example,

has reported 157 cases with a single death—equivalent to about 0.6 per cent.—and Fehling ninety-one cases with no death.

The general indication for operative interference as promptly as possible cannot, however, be gainsaid. Schauta, for example, after a careful study of the literature, collected 123 operative cases, with a mortality of 5.7 per cent. and 121 cases treated palliatively, with a mortality of 86.89 per cent., although in another series of more carefully selected cases, he found the mortality by palliative treatment to be only 65 per cent.

To recapitulate the diagnostic features: 1. There is sudden pain nearly always, the exceptional cases being those with sudden collapse, as in two cases which I reported at the Keuka Lake Medical Association, July, 1909.

2. Uterine hemorrhage occurs within forty-eight hours after the initial pain. This symptom and sign is common to all cases of ruptures or aborted tubal pregnancy.

3. Add collapse and the diagnosis is complete. If collapse is lacking, or slightly marked, it is on account of gradual internal hemorrhage, when, on examination, the culdesac will show a progressive bulging.

859 HUMBOLDT PARKWAY.

RESULTS AT LEBANON HOSPITAL OF DEFERRED OPERATIONS FOR EXTRAUTERINE PREGNANCY.¹

BY

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By deferred operation for extrauterine pregnancy we mean that when a patient is brought into Lebanon Hospital in profound shock the operation is deferred until her condition is markedly improved, which is usually from one to three or four days. The historian of the hospital, Dr. M. L. Bookman, reports eighty-one cases, about 70 per cent. of which were brought into the hospital in profound shock. Out of this number three died. One had been operated on and was making a perfectly good convalescence, then suddenly died of pulmonary embolism. Two were brought into the hospital in profound shock and shortly died, no operation having been performed. The diagnosis of extrauterine pregnancy was invariably confirmed,

¹ Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists held at Syracuse, September 20-22, 1910.

either by operation or postmortem examination. If there is no shock, or it is only slight in character, the patient is always operated on as soon as possible after admittance to the hospital.

In a number of instances it has been noticed that patients who had suffered from profound shock had much less free blood in their abdominal cavities than those who had very little or no shock. This has led me to believe that the shock is not entirely due to the escape of blood from the vessels but, in part at least, to a nervous influence produced by the sudden escape of blood into the peritoneal cavity, causing dilatation of the general arterial system, and so reducing the blood pressure to a dangerous point.

There are many recorded instances where a blow over the pit of the stomach, especially when the digestive processes are active, as is the case shortly after a full meal, has resulted fatally, and on postmortem examination there has been no anatomical lesion to account for death. In military and railroad surgery capital operations immediately following the receipt of the injury, before reaction has set in, have resulted most disastrously. During the early part of the Civil War it was customary to do a large amount of amputating on the field, but the results were so bad that the surgeon-general's office issued an order prohibiting this practice as far as possible.

Ovarian pregnancy is possible, but it is so extremely rare that, from a clinical standpoint, tubal pregnancy and extrauterine pregnancy are synonymous. In the lower animals it is generally believed that the ovum is impregnated in the tube, and the probabilities are that in the human race the same thing takes place in a large percentage of cases, and if from some anatomical defect in the tube or its lining the arrest of the impregnated ovum is caused, tubal pregnancy results. Probably in from 5 to 10 per cent. of tubal pregnancies tubal abortion takes place, usually of an embryo that has previously perished, and you have a succession of hemorrhages from the fimbriated end of the tube. These hemorrhages may be slight, and the tube may eventually empty itself and recovery take place. In a few instances a living embryo is expelled into the abdominal cavity, and a sufficient placental attachment remains to nourish the embryo which in rare instances reaches maturity.

In from 90 to 95 per cent. of tubal pregnancies probably the above does not take place, and the impregnated ovum develops in some portion of the tube; and at Lebanon hospital we have

noticed that the symptoms develop at an earlier date in the pregnancy and are usually more sudden in advent when the pregnancy is near the uterine end of the tube, the worst type being when it develops in the tube where it passes through the wall of the uterus—the interstitial variety.

After a most careful investigation it seems to us that the first symptoms show themselves between the third and sixth week of pregnancy. In many instances neither the patient nor her friends have the slightest knowledge that anything is wrong until there is severe pain followed by collapse. There are a few instances where the first symptoms of extrauterine pregnancy do not show themselves until the expiration of two to three months. The question of the time of pregnancy in all of these cases is obscure, especially in the class of people that we come in contact with in hospital practice, many of them paying little attention to their complaints until severe illness is developed. It is not an uncommon thing for patients suffering from tubal pregnancy to menstruate, and the slight irregularities which are almost invariably present during the early part of extrauterine pregnancy are paid little attention to, especially in women who are subject to more or less irregular menstrual flow.

Another class of patients have given birth to a child or had an abortion and have become pregnant before the menses have been established. We have had a number of cases of extrauterine pregnancy in this class, and the first show of blood, which was due to the ectopic, has been believed by the patient to simply be the normal return of menstrual flow after its cessation following the gravid state. This fact and the fact that in many instances the return symptoms of tubal pregnancy are very slight and, in the experience of the patients, very rare has led away from the true diagnosis of the condition, and over half of the patients suffering from extrauterine pregnancy admitted to Lebanon Hospital believe that they are suffering from some other malady, especially incomplete abortion and appendicitis.

The following case very nicely illustrates the above fact, and also the condition of many of the patients we are called upon to treat.

Mrs. A. R. was admitted to the general surgical department January 25, 1910, with a diagnosis of appendicitis, her chief complaint being severe abdominal pain and marked prostration.

I was requested to see her in the afternoon of the same day, and found her in collapse, with a distended and tympanitic

abdomen, temperature 101, pulse very weak and rapid. She was restless, anxious, extremely pale. There was a mitral systolic murmur at the apex, transmitted to the left; also a systolic murmur at the aortic valve; otherwise the heart sounds were good. Blood count showed red blood corpuscles 3,250,000; hemoglobin, 70 per cent.; white blood count, 20,000. Differential count: polynuclears, 87 per cent.; large mononuclears, 9 per cent.; lymphocytes, 4 per cent. The abdominal distention was much more marked than is usually the case in extrauterine pregnancy. The attending surgeon, Dr. Parker Syms, saw the case with me, and said that, while he was in favor of opening the abdomen in severe intraabdominal conditions, in this instance was thoroughly convinced that the patient's condition was so bad that she would not survive an operation of any kind. She was given a small amount of morphine hypodermically, and a pint of saline at 110° F. by the rectum. After this first enema she was given 8 ounces of saline every four hours.

The following day her condition had slightly improved, and two days following her admittance to the hospital her condition had so markedly improved that the house surgeon was very much surprised when I told him that we would open the abdomen. An ordinary median incision was made, and it was found that the distention of the abdomen was in the main due to gas in the intestine, and though this patient had been in very profound shock, it was found that there was much less blood in the abdominal cavity than is ordinarily the case in extrauterine pregnancy. In this instance there were no evidences of previous intraabdominal hemorrhages having taken place. The pregnancy was in the right Fallopian tube, about 1/4 of an inch from the horn of the uterus, and was of the type that in our experience has been associated with marked shock. The tube was removed, leaving the ovary in place. The abdominal wound was closed after the ordinary method. The entire operation required seventeen minutes. She made an uneventful recovery.

The treatment of this disease has been through several stages of development. Formerly the diagnosis was rarely made. When it was, and it was uncertain, there were many who strongly advocated killing the embryo by injecting material (usually morphine) into the sac, or by use of an electric current. Numerous cases were reported where this treatment was instituted, and the embryo was supposed to become absorbed. Results following this method were so unsatisfactory that it was aban-

done, and the treatment that is usually followed to-day has been gradually established; that is, to operate on the patient and remove the offending part as soon as the diagnosis is made. Of course, if rupture has not taken place, or if there have only been slight ones, with very little shock, this is ideal and many times the operation can be performed through the vagina which, in my belief, is a much more dangerous operation than where abdominal section is resorted to.

Unfortunately, in many instances the first time we see the patient she is in profound shock, with a very weak or imperceptible radial pulse, and I am thoroughly convinced that this is not the proper time to open the abdominal cavity, either from above or below. At Lebanon hospital we elevate the foot of the bed to prevent the patient from dying from cerebral anemia, and give a hot (110° F.) enema of a pint of normal saline. In extreme cases saline is given once in the cellular tissue under the mammæ, in addition to the enemata. If the temperature is above normal, an ice-bag is applied to the lower portion of the abdomen; otherwise not. No cardiac stimulants are given, fearing that they might cause a clot to be washed away that may possibly be forming in a ruptured vessel. The saline enemata are given every four hours, usually 8 ounces at a time, and as the patient improves the interval is lengthened to six hours. If, as is frequently the case, these patients are extremely nervous and restless or are suffering from severe pain, small amounts of morphine are given hypodermically, for it is believed that absolute quiet is essential in all of these cases.

We have many patients brought into the hospital in a very desperate condition, and out of the eighty-one cases that I have referred to above there have been but three deaths. It was thought that two of these patients would die in the ambulance. They were freely stimulated and reached the hospital moribund. At no time after reaching the hospital would they have stood an anesthetic or the slightest operation. Autopsies proved the diagnosis of ruptured extrauterine to be correct. The third patient who died was one of those unfortunate cases that are occasionally met with by all surgeons, where the patient was making an absolutely normal convalescence, when she suddenly died from pulmonary embolism. Seventy-eight other cases were operated on by the abdominal route and recovered.

After a severe hemorrhage another does not take place in less than from a week to ten days. In from two to seven days,

depending upon the condition, the abdomen is opened from above. The clots and free blood are rapidly removed with the hand and dry gauze sponges, but the abdominal cavity is never irrigated. Formerly, where the patient had lost a large amount of blood, we put a quart or two of normal saline solution in the abdominal cavity, and left it there to be absorbed. More recently this saline has been given in rare instances in the cellular tissue by hypodermoclysis, or more frequently in the rectum. In one instance only in the above cases was the abdomen drained; in all others it was closed. The entire operation requires from eight to twenty minutes. I prefer the abdominal route, because the operation can be performed much quicker, and when the mass is high up and the vagina small, much better. It might be well for me to state in this connection that I perform many operations on the tubes and ovaries through the vagina. So you can readily see that I am not prejudiced in favor of the abdominal route.

In a recent article Elliot said that in the Massachusetts General Hospital all of the deaths due to extrauterine pregnancy were in those cases that were operated on while the patient was in extreme shock. At one time, as I thought, shock was due entirely to the loss of blood, but I have operated where the symptoms were very severe, and found a comparatively small amount of blood had escaped from the ruptured vessel, and in other cases, where the symptoms were less marked, have found the abdominal cavity filled with blood. In the main, the symptoms are those of shock, due to the sudden escape of blood into the abdominal cavity. During severe shock from any cause patients seldom stand operations well.

54 WEST SEVENTY-FIRST STREET.

DISCUSSION.

These two papers were discussed jointly.

DR. L. F. SMEAD, of Toledo, Ohio, reported the case of a woman, twenty-five years of age, who was brought to him with a diagnosis of ectopic pregnancy. This was her second pregnancy. Her first pregnancy was cared for by a physician who brought the case to him, so that they knew the exact condition. At the same time, there were no abnormal symptoms. The history of the case was that for two or three days there was a slight pain in the right side, and during the night preceding the day on which he saw her there was a slight vaginal flow. There was no tenderness in the abdomen, and on vaginal examination he found a slight mass over the right cornu of the uterus. The question was whether it was an ectopic pregnancy.

The things he considered were these: first, he considered it possibly tubal, with a slight rupture into the broad ligament; second, interstitial pregnancy in the cornu; and, third, he considered the possibility of development of the placenta in the right horn of the uterus. The uterus was fully as large as it should be at about three months. As the examination was quite satisfactory with her abdominal muscles relaxed, he decided later that probably a threatened abortion was taking place with the placenta in the right cornu of the uterus, and he decided to treat the case in that way, as he was not anxious to open the abdomen in a normal pregnancy and overlook an interstitial pregnancy in the cornu of the uterus. Two months had elapsed since he saw the woman; the symptoms had disappeared, and apparently a normal pregnancy was progressing.

DR. H. W. Longyear of Detroit, Michigan, said that this matter of deferred operation in cases of extrauterine pregnancy in the presence of shock had been threshed out in this association several times, and if he remembered rightly the consensus of opinion had been decidedly in favor of immediate operation. It was his opinion that operation should be done in these cases even in the presence of extreme shock. He knew of no other class of cases in which surgeons waited in the presence of hemorrhage for shock to cease. We operated primarily for the control of hemorrhage, and to wait for shock to cease in some cases would be fatal.

DR. J. H. CARSTENS of Detroit, Michigan, thought Dr. Longyear had struck the keynote, namely, that if there was a hemorrhage from a leg that had been cut off, we would not wait for shock to subside, but we would try to stop the hemorrhage. He believed in operating on cases of ruptured extrauterine pregnancy promptly.

DR. WILLIAM H. HUMISTON of Cleveland, Ohio, had had an unusual record in cases of ruptured tubal pregnancy; that is, he had yet to have his first fatal case, and he operated on them as soon as he could get them ready for operation or got his instruments there and assistants. He did not care what condition the patient was in, whether in shock or not.

DR. HENRY S. LOTT of Winston, North Carolina, emphasized the character of the pain. Several times he had made a diagnosis of ectopic pregnancy in the early weeks by sitting by the side of the bed of the patient and watching her for several hours, and the pain was always recurrent, rhythmic, and expulsive; whereas, if the appendix was the seat of trouble the pain was continuous without intermissions and very often without remissions.

DR. J. GARLAND SHERRILL of Louisville agreed with Drs. Carstens and Humiston. If there was a ruptured vessel internally, we would consider it one of the most dangerous forms of hemorrhage we had to deal with. If we had a case of gunshot wound of the abdomen, we would not wait any length of time to open that abdomen, but operate at once, and the same course should be pursued in cases of ruptured extrauterine pregnancy.

DR. E. GUSTAV ZINKE of Cincinnati, said there were exceptional cases. Extrauterine pregnancy was not always the same in every case. Some of these patients recovered without operation. Tubal pregnancy terminated in three different ways, namely, tubal abortion, rupture between the layers of the broad ligament, and rupture of the tube into the peritoneal cavity. In the case of rupture between the layers of the broad ligament we had a well defined tumor formed. In the case of rupture into the peritoneal cavity there was sudden shock and all the signs of internal hemorrhage, and this was a case in which prompt action was indicated, and it was for the operator to decide whether an operation should be performed at once or whether he had time to wait. In those cases in which the tube ruptured into the peritoneal cavity with severe hemorrhage, with all the symptoms of shock, in which the picture was complete, we did not see the patients in a hospital, but usually at their homes or in places where opening of the abdomen was prohibited. It would mean death to operate at once because the surgeon was not prepared and the patient was not prepared. Experience had taught that by putting these patients in the recumbent position and keeping them there with an ice-bag over the abdomen and lowering the head and preparing to operate, that within half an hour or an hour improvement in the patient's condition would take place. The pulse came up, it began to get stronger, and with the appearance of a stronger pulse, on digital examination one could feel the formation of a tumor through the vagina. In cases where that tumor did not appear the vaginal vault became more or less flattened. There was no resistance. One felt nothing apparently. In these cases hemorrhage went on, and they were the ones that should be operated on at once, for if operation was done they would die. But in the other instances, where a tumor formed, we could afford to wait longer, and encapsulation would take place, and the patients could be operated on with absolute safety within a few days or even weeks.

DR. LEWIS S. McMURTRY, of Louisville, said the diagnosis of extrauterine pregnancy was easy. He had known women who had had one attack of tubal pregnancy and were operated on to make the diagnosis themselves in the second instance and call the doctor and tell him the condition that existed. He had one instance of that kind in mind, and there was no trouble in making the diagnosis and in resorting to prompt treatment. When a woman was bleeding to death inside there was only one indication, and that was to operate as soon as possible.

DR. CHARLES L. BONIFIELD, of Cincinnati, laid emphasis on the point that in these cases by the time the operator got to the patient usually hemorrhage had taken place, and the surgeon did not operate to stop hemorrhage, but to relieve shock, because in the majority of cases the hemorrhage had already stopped. The patients who bled profusely did so quickly until blood pressure was relieved, and then bleeding was slow until it stopped entirely.

DR. WALTER B. CHASE, of Brooklyn, New York, said that every member of the Association thought, at least, he was grounded in the principles of surgery, but there were different methods of reaching the same end. We could not make a universal rule which would apply to every case of tubal pregnancy. The man who attempted to do so would go wrong more than half of the time. Every case must be treated according to the findings and according to whether the physician was prepared to treat it at the time.

DR. JOSEPH PRICE, of Philadelphia, felt that cases of ruptured ectopic pregnancy and all perforative forms of disease belonged to the calamities, and to save life we should be prepared to operate promptly. The surgeon should be the cleanest and most prepared man living.

DR. CONGDON, in closing the discussion on his part, said it was not always his policy to cross swords with his friends, but when they made the assertion that the diagnosis of ectopic pregnancy was always easy and anyone could make it without any preparation, he must certainly take exception to that statement. The members of the Association meant that they could make a diagnosis of this condition, but not the average general practitioner.

TUMORS OF THE BLADDER.¹

BY

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AND

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As a preliminary procedure in determining the nature of the surgical intervention to be followed in the above condition one should, by means of cystoscopic examination, ascertain the exact location, whether the cause for removal be single or multiple, pedunculated or sessile, villous or cauliflower, in appearance. The occasion for such examination in the vast majority of cases will prove to be an intermittent spontaneous hematuria; rarely, when the growth is located in the region of the vesical neck, the blood will be more marked at the end of urination. This hematuria is capricious, entirely independent of external causes, such as obtains in the case of vesical calculus; in fact, it frequently is more marked when the patient is resting in bed, disappearing and reappearing without dis-

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cernible cause. There may be intermittent obstruction to the outflow by either the mass or fragments plugging the internal orifice, as observed in one case of papilloma. Occasionally, however, there may be a rebellious cystitis requiring cystoscopic examination which first reveals the presence of a vesical growth. Thompson has called attention to dysuria as an indication of malignancy; it would appear, however, to be more of a determining factor in cystitis than in the former.

For the cystoscopic examination it is best to employ an instrument carrying a direct and an indirect telescopic tube, thus giving a vertical as well as a horizontal picture. In this way one obtains a better idea as to the extent of the pedicle, a most important item in determining the mode of approach. Careful but thorough irrigation is a very important requisite in the conduct of this procedure, as, while it is proper when possible to undertake the examination in the interval of bleeding, nevertheless cases present themselves for diagnosis in which the hematuria is either so abundant as to require immediate intervention, or, as in a recent case under the observation of the junior contributor to this paper, of a gland-cell carcinoma with pedunculated outgrowths situated about the left ureteral orifice, and in which the hematuria was constant for forty days; while during nine months prior to this there had been complete absence of blood. This period followed three months of constant hemorrhage.

The irrigation is best conducted from a reservoir through a double-current tube, having a small inflow and a large outflow. By means of this appliance too sudden distention of the bladder is avoided, while the large outflow affords ready evacuation of the clot; and the addition of an adjustable diaphragm attachment permits of the leisurely interchange of the various telescopic tubes without the customary jarring, with its attendant traumatism.

Beyond ascertaining the exact situation, the extent of pedicle, and the size and general physical characteristics of the growth one should not go. Least of all should one attempt anything more than a tentative diagnosis, inasmuch as pedunculation is by no means a definite indication of benignancy (Albarran reports twenty-eight pedunculated growths, thirteen being benign and fifteen malignant); and not infrequently do pedunculated growths present themselves as outriders from a malignant base. Nor should much dependence be

placed on the microscopic examination of particles spontaneously expelled, while frozen sections at the time of operation may be misleading; and the fact that an induration of the pedicle at its site of implantation may be the result of a hypertrophy of the connective-tissue element of a benign growth, rather than an indication of malignancy, serves to accentuate an already complex situation.

It is well to reinforce our cystoscopic examination with a stone-searcher exploration, as by means of this examination one may determine fairly accurately the degree of infiltration presenting in the growth. In three cases of vesical carcinoma coming under the observation of Dr. McCarthy a correct diagnosis was arrived at in this manner. Rectal palpation should always constitute a step in the examination. It may be advisable to catheterize the ureters before operation. Inasmuch, however, as the growth in the majority of cases is situated near one or the other orifice this procedure is not infrequently found impossible, as there may be complete obstruction of the orifice by the neoplasm. In such event one should catheterize the ureter on the healthy side, to serve as a guide in locating the other. This should be attempted first with the indirect prismatic cystoscope. Failing in this the Buerger cystourethroscope, or the aspirating cystoscope of Luys may be employed. Should this prove unsuccessful the catheterization may be conducted through the open bladder by means of the last-mentioned instrument. This operation should, however, be necessary only in the event of obstruction of the ureteral mouth by the growth, as with the present armamentarium one should hardly fail otherwise.

The operative procedure will depend upon the pathologic appearance, the location of the tumor, the type of attachment; and finally as to the number—whether one has a single growth or multiple ones to contend with. Those tumors or growths which to the examining eye present an appearance of infiltration about the pedicle, or about the margins in a sessile growth, should be as fully removed as those pronounced malignant; while in the soft pedunculated and sessile type excision through the mucosa is all that is necessary.

In regard to position, one cannot attack a growth in the immediate vicinity of the ureteral orifices without being prepared to do a new implantation. When multiple growths are present either a wide removal of the surrounding mucosa

or a partial resection of the bladder may be found necessary. Pedunculated growths of an apparently benign character situated in the immediate vicinity of the ureteral orifice, however, may be removed as in another situation without much fear of injury to the ureter, care being taken to leave room enough when suturing the mucosa for the escape of urine from the ureter, as subsequently the latter reassumes its original appearance. Infiltrating growths situated about the ureteral orifice or on the anterolateral wall near the internal vesical opening require fairly extensive resection through the entire bladder wall, at least two centimeters beyond the affected area.

Infiltrating growths of questionable malignancy from a clinical standpoint, and necessitating the removal of considerable bladder area, may be removed after the method of Charles Mayo (*Annals of Surgery*, Vol. XLVIII, p. 107): "The patient is placed in a high Trendelenberg position, and a median incision made from the pubes upward for 6 inches or more; the pelvis is well packed with gauze pads which hold the intestines in the upper abdomen. The abdominal incision is also protected by gauze pads. The bladder is caught up by two tenaculum forceps, lifted into the wound and opened by a 2-inch median incision. The small amount of fluid in the bladder is absorbed with gauze and the incision is enlarged upward and downward until it is ample for the purpose. The tumors may be cut from the bladder with scissors and the denuded area burned with cautery.

"The bladder wound, regardless of its size, is closed by a through and through continuous suture of catgut introduced in the original Connell method. This stitch is a running mattress suture and is passed through the entire thickness of the bladder wall, all loops passing from the mucous side, and when drawn close making a complete air-tight and water-tight continuous mattress stitch. The line of suture is now protected by a suture of silk, or preferably linen, applied as a Cushing parallel peritoneal suture, taking a square bite of the perineum first on one side then on the other of the line of closure, the needle being inserted parallel with the incision. This suture approximates the peritoneum and protects the primary suture just as when it is employed in gastro-jejunostomy, and is used for the closure of all the bladder incisions and resections, regardless of the amount removed."

Mayo further states in this same paper "That there are few

lymphatics in the bladder, and these are exceedingly inactive, which fact delays metastases of malignancies, rendering them for a considerable period inactive, and that carcinoma of the bladder may, when taken early, be considered curable by operation.

Berg (see *American Medicine*, June, 1910) is rather pessimistic on the question of long postoperative duration without recurrence. Harris, in the *Annals of Surgery* for October, 1902, claims that two-thirds or more of the bladder may be removed, and that the remainder will regenerate (?) (interrogation J. F. Erdmann's) and dilate to such a degree as to become a serviceable organ in many instances.

In view of the great number of intraperitoneal ruptures of the bladder operated upon, both by the general and the special surgeon, during the past twenty-five years, it appeared to the authors rather strange that the transperitoneal operation for the removal of bladder tumors had not been advocated years ago. Careful investigation of the literature, however, shows that Albarran in his "*Tumeurs de la vessie*," 1891, quotes Rydigier (*Weiner Medicinische Wochenschrift*, 1885) as advocating the deliberate transperitoneal resection of the organ, calling it laparocystectomy. (The authors have been unable to verify this reference.)

A great portion—one might say the majority—in single tumors of pedunculated papillomata surmount one or the other orifice. In seven cases of vesical neoplasms examined by us four were located about the left ureteral orifice, two about the right, and the most recent case involved the anterolateral wall just posterior to the ureteral orifice.

In such cases the possibility of injury to the ureter is always to be considered, and should the pedicle be infiltrated so that the growth is within a quarter of an inch of the ureter, the ureter should be excised at this point and a new implantation done. Where, however, the necessity of resecting a small bladder area with implantation of the ureteral orifice presents itself, this may be conducted extraperitoneally. It is desirable when possible to introduce a ureteral catheter to serve as a guide in locating the ureter as well as in its subsequent implantation.

In the extraperitoneal operation, having stripped the peritoneum laterally down to and beyond the ureter, one resects through the entire bladder wall, either from without inward or from within outward, as the case may be, employing the tumor

mass and the ureter with its catheter as a pedicle. The bladder wall should be cut in such manner as to permit of proper closure of the wound. The ureter may then be implanted in that angle of the wound closely approximating its original situation, or it may be relocated by buttonholing the bladder wall, having in mind at all times the desirability of placing it as near its original position as possible, as well as the avoidance of kinking.

Immediately upon opening the bladder the entire vesical mucosa should be carefully searched for small outgrowths, which when found should be snipped with scissors and the stump cauterized before devoting our attention to the main growth. The necessity for such action arises from the fact that after exposure the mucosa becomes thrown into the folds which readily obscure small outgrowths, and which without removal would constitute a potential source of recurrence of the original condition.

Cystoscopic cauterization has been strongly advocated by Nitze, and the report of a few successful cases by Luys has been noted; while quite recently, intravesical treatment has been supplemented by Beers and Keyes of New York and others, who have practised fulguration or high-frequency currents in a few cases. This method, while showing considerable destructive action to the growths, is still in the experimental stage. It has, however, demonstrated in these cases its ability to bring about a cessation of hemorrhage in papillomata, something we have heretofore been unable to control. Of this method we will speak later.

In one case of carcinoma of the bladder coming under the observation of the junior contributor, Hodenpyle's serum was employed, but the patient reacted so unfavorably that its use was discontinued. Sarcomata or other neoplasms invading the bladder by extension from the prostate may be treated by lumbar nephrostomy. In view, however, of the exceedingly great number of recurrences, and the almost invariably fatal nature of the condition, it would appear advisable to regard it as an inoperable one, and limit our interference to the employment of palliative measures.

It would appear, too, that cystoscopic operative procedure should be limited to small, well pedunculated growths and the alleviation of hemorrhage in extensive recurrences; and that the best results are to be had from early diagnosis and wide removal either of the mucous membrane in the apparently benign type,

or extensive resection of the entire bladder wall, either extra- or transperitoneally, with or without ureteral implantation, in the cases presenting indications of malignancy.

In three cases of well pedunculated growths seen and operated upon by J. F. Erdmann, one fairly small, one almost filling the bladder, and the third as large as an English walnut, the usual suprapubic operation was performed, and it was found in the progress of the cases that a small portable electric light and a Kelly proctoscope or Ferguson speculum were of decided benefit. The former allowed of free inspection of the bladder, while the latter was a useful contrivance during cauterization of the denuded area, preventing burning of the healthy bladder beyond the seat of involvement.

The bladder being opened and the growth outlined, a pair of Hunter or allied forceps were used to seize the pedicle, gentle traction was made so as to "cone" the mucous membrane and deeper walls of the bladder, then a curved forceps was used to seize the raised cone below its base. The growth was then excised and sutures of catgut placed below the clamp similar to the procedure in operating for hemorrhoids. The cautery was used within a Kelly proctoscope in one case for rather free bleeding from the upper angle of the wound. Guyon has devised a forceps for seizing the pedicle (see *Albarran*, 1909, p. 620), shaped somewhat like a sickle, that should work most satisfactorily in this type of removal.

Although I (J. F. E.) did not close the bladder in any of the three cases of pedunculated papilloma operated upon by me, I feel that I shall certainly do so in any subsequent noninfected cases. If we control hemorrhage at the time of removal of the growth, the use of a retention catheter for a couple of days, or an every three- to five-hour catheterization should be ample protection against leakage or rupture and infection, and would thereby diminish our patients' convalescence by weeks. A double-current catheter constant irrigation might also be an agent to promote prompt repair.

In my second case, a papilloma the size of an English walnut, a very disagreeable pelvic and saphenous phlebitis complicated an otherwise slow convalescence.

CASE I.—Service of J. F. Erdmann. E. F., forty-two years of age, was operated upon on October 30, 1905, previous to which time he gave a history of repeated vesical obstruction, with voiding of blood and bloody urine. The obstruction, which

was of a temporary nature, was usually relieved by the passing of a sound. When seen by me he had just experienced an attack of this sort in the South. The character of the obstruction was somewhat similar to that of stone. The stream would shut off suddenly, but without pain, and all the straining possible would fail to release the obstruction. At the time of the attack in the South a small white fragment was passed, which he preserved and brought with him. On gross appearance it resembled a fragment of papilloma. Microscopic examination demonstrated it to be of papillomatous material. Cystoscopy a couple of days later showed a papillomatous growth on the outer side of the orifice of the left ureter.

The operation was done suprapubically. The growth was about as large as a chestnut, and the small pedicle was clamped off and treated as described above. Upon releasing the clamp after tying the suture I found rather free spurting of blood from the upper angle of the wound. A Kelly proctoscope was introduced, so as to enclose the area operated upon, and with the aid of a small electric light the bleeding point was rapidly sponged and effectively touched with the actual cautery. The patient was discharged in sixteen days.

CASE II.—Service of J. F. Erdmann. H. F., aged forty, visited me in September, 1907, and gave a history of occasional bleeding in a very short period of time. The urine varied from a slight evidence by microscope to very profound evidence of fresh and disintegrated blood. On his second visit to me in the office he passed urine the color of coffee, filled with sediment. There were no evidences of pain whatever at any time in his history, his attention being called to the trouble by seeing the discoloration of the urine. Cystoscopy showed a papilloma about the size of a filbert, near the right ureteral orifice, and pedunculated. This was removed September 23, 1907, and, barring a phlebitis, both pelvic and saphenous; his convalescence was without further note, the wound in the bladder having healed in fourteen to sixteen days. The method of removal was suprapubic. The pedicle was grasped in the forceps and excised through the mucosa and submucosa, with final suture.

CASE III.—Service of J. F. Erdmann. A. C. M., about thirty years of age, came to me November 27, 1906. Eighteen months before, while urinating, he noticed that he was passing blood, and that at certain times it would be almost pure blood. Then there were evidences of intermittent bleeding, sometimes just enough to stain the urine, sometimes profound discoloration with clots. There would occasionally be a spasm upon urinating, before the bladder was empty. In the past two months there had been no visible evidences of blood until one week before his visit, when he observed fairly profound evidences again. Bloody urine would be induced by jumping on and off cars. He had never had any pain referable to kidneys, perineum, bladder, or urethra, and no thigh or leg pains. Health otherwise was

absolutely perfect. Once he had slight pain in his groin; occasionally has had pain in the lower right side. Has never had any specific disease. He said that the first voiding of blood occurred subsequent to taking a bottle of citrate of magnesia, which was followed by violent catharsis. Urine analysis was negative as to kidney cells, casts, and the like. He had never had any putrid urine, nor been examined by cystoscope or searchers. There had been no loss of flesh. He voided an ample quantity of urine. Cystoscopy showed papilloma of very large size, which apparently arose from the left side.

Suprapubic operation was done on Thanksgiving Day, 1906. Upon exposing the interior of the bladder it was found that the papilloma arose from a base of 1 1/2 inches in length and 1/4 inch in width, just above and to the left of the left ureteral orifice. The papilloma itself was one that practically filled the hand. Removal was made by means of excision and suture of the gap in the mucosa and submucosa. The patient made a recovery in a period of three to four weeks.

CASE IV.—Service of J. F. Erdmann. This was a case sent me for diagnosis through the courtesy of Dr. Pomeroy, of Waterbury, Conn., and gave the following history: P. L., age thirty-six. Gonorrhea three years ago, and bloody urine off and on for ten years. Has had no pain, no lump, and no weakness except from bleeding. Goes for a period of time with no bleeding, then will have bloody urine for three or four weeks. Has passed clots. Examination by cystoscope showed a beautiful large papilloma to the left. I herewith append a letter from Dr. Pomeroy, following the operation:

"I have been waiting for the pathologist's report before answering your letter regarding the case of P. L. I took him into my service at the Hospital and we operated on him February 14. I found a single papilloma near the left ureteral opening, pedunculated, and about the size of a mandarin orange. The pathological examination did not show any evidence of malignancy. The pedicle showed no cell infiltration of either epithelial or connective-tissue types. The patient made an uneventful recovery, and was discharged cured March 5."

CASE V.—Service of J. F. Erdmann. J. K., age fifty-five, has had bladder difficulties for a number of years, voiding three to five times at night and every half-hour or oftener during the day. Pain on riding, similar to that manifested by stone in the bladder; stream has been known to shut off; passes blood occasionally; is not certain, but thinks he has lost flesh. Examination by cystoscope showed no evidences of stone, but a large tumor, pedunculated, and about 2 inches long, 1 1/2 inches wide, and 1 inch deep, was found situated on the fundus, slightly to the left of the median line, covered over its greater area with a calcareous deposit. This deposit was felt by his family physician, who sent him to me for a stone in the bladder.

Operation, suprapubic transvesical. Analysis proved the growth to be epithelioma.

This operation was done on July 22, 1910, and, although rather early to include in a paper, he presented such a marked improvement in symptomatology that I feel the case is worthy to be reported.

In addition to these cases two malignancies of the bladder in females have occurred in my service; one in a woman of forty-seven, in whom the tumor was a typical carcinoma and situated in the left ureteral zone. Her history is as follows:

CASE VI.—Service of J. F. Erdmann. I saw this patient ten years ago, with a large tumor involving the left area of the bladder wall, in the vicinity of the ureteral orifice. The growth was so advanced that it was impossible to state whether or not this tumor had been a papilloma with malignant degeneration. No operation.

CASE VII.—Service of J. F. Erdmann. Miss H., forty-four, the second of the female patients mentioned above, came to me in September, 1908. She had been perfectly well up to two years before this time. She first noticed bloody urine at the urethra, and was operated upon for urethral caruncle. She had a cessation of menses for one year, then a recurrence. From June to September she had passed blood daily. The voiding of urine with blood has always been painful. Some loss of flesh. The external meatus was negative, but the floor of the urethra near the internal meatus was enlarged to about the size of the thumb, and continuous with a large mass in the left portion of the bladder. No uterine invasion. She returned in December, having refused operation at the previous visit. At this time I did a suprapubic section, and found that the growth involved over 50 per cent. of the bladder capacity. Dr. Brooks of Carnegie Laboratory reported the analysis as follows:

"The growth is a carcinoma of the encephaloid variety. In so far as one is permitted to judge from the histological structure and especially from the type of the cells and their arrangement, one would think that the growth was most likely to have originated from the mucous membrane of the bladder. This is the youngest case of primary cancer of the bladder that I have ever seen in a woman."

Dr. Brooks further remarks that in his experience primary malignant tumors of the female bladder are quite rare, and in this I agree with him, having seen but the two cases here recorded. I concluded this operation by simply removing the section, and establishing for the patient's comfort a suprapubic drainage. She died in February, 1909.

Since writing the above portion of this paper, which was to have been presented before the Genitourinary Section of the New York Academy of Medicine last spring, cases numbers one

and two have returned with histories of blood showing in the urine.

Case I, upon cystoscopy showed a large mass, suspicious of malignancy, to the left of his bladder near the ureteral orifice; while Case II shows upon cystoscopy four papillomata that to all visual signs are benign.

These two cases I have turned over to Dr McCarthy for experimental fulguration. His citation is appended below, with reports of three other cases.

CASE VIII.—Service of J. F. McCarthy. Male, age sixty-five, admitted to Bellevue Hospital two and a half years ago. Hematuria for six months, spontaneous. At the time of admission he was in a state of uræmic coma which lasted about three days, after which time his condition improved. At this time his bladder capacity was 3 drams. Following three months' observation and treatment his capacity was brought up to 16 ounces, and cystoscopic examination showed cauliflower growth over the right ureteral orifice, probably malignant. Operation refused, and observation continued to date.

Observations.—Bladder lavage in this case, contrary to the general belief, brought about marked improvement, and while its effect on the hematuria was little if any, it none the less greatly increased the bladder capacity, and the patient has gained 20 pounds during this time. Creolin was found to be the best in lavage.

CASE IX.—Service of J. F. McCarthy. Italian, age forty, hematuria intermittent in type lasting one year. One interval of six months with absence of macroscopic blood. Cystoscopic examination revealed cauliflower growth totally obscuring the left ureteral orifice.

Operation.—The bladder was opened, and a large infiltrating growth involving the base and lateral walls, and including the ureter on that side, was found. It was deemed advisable simply to remove a section for microscopic examination. The report was a gland-cell carcinoma. The wound apparently healed, but within three months, during which time the growth increased to immense proportions, the patient died. Before leaving the hospital, however, he was subjected to several injections of Hodenpyle serum, but he reacted violently after each injection, and with no apparent beneficial result.

Observations.—Contrary to the usual custom this neoplasm in a short time underwent a very marked increase in size.

CASE X.—Service of J. F. McCarthy. Coachman, age fifty-six, well preserved. Hematuria for six months. Cystoscopy showed a well marked cauliflower growth obstructing the left ureteral orifice, and a widespread condition greatly resembling a bullous edema.

Operation.—The bladder was opened, the growth grasped

with a Guyon tumor clamp and cauterized with actual cautery to its base. Upon release of the clamp a well defined gush of urine escaped from the middle of the mass. Following the operation the hematuria disappeared, and since that time, a period of four months intervening, the patient has enjoyed apparent good health. Subsequent cystoscopy shows the above-mentioned edema as persisting, and a well marked cicatrix at the site of the tumor.

Observations.—Unusual feature of well defined bullous edema; also the fact that active cauterization which must have involved the ureteral mouth has had no subsequent ill effect on the latter. (See Albarran.)

Dr. McCarthy's report on CASE I: recurrent after nearly five years. One large villous growth situated just behind the left ureteral orifice. Three fulguration treatments with marked diminution in size.

Remarks: fact of recurrence at a site remote from the position of the original growth.

Dr. McCarthy's report on Case II: recurrent papilloma after nearly three years. Four small papillomatous outgrowths at the site of probable incision in the roof of the bladder, and one larger similar mass on the left lateral wall. Three fulgurations with the Oudin current, with hematuria absolutely stopped, and considerable diminution in the size of the growths.

Remarks: marked effect on the hematuria, which may be brought about by no other known agent.

As to Fulguration.—I find the technic incomparably more difficult than ureteral catheterization, and consider that the procedure should be confined to those expert in cystoscopic operation. Of course the work done along this line is at present in so immature and incomplete a state that one should be exceedingly conservative in anticipating results. That it does, however, bring about a cessation of the hematuria in the vast majority of cases there can be little doubt, and this in itself is a distinct gain. It is also a well-known fact that this agent will destroy similar growths on the skin surface of the body, and it would seem that the water medium customarily employed may ultimately be dispensed with in favor of air dilatation, and in this way it is my opinion that a much more rapid and profound action may be anticipated. In my work in intravesical fulguration I have found it essential to have absolute control of the make and break of the current, and to this end I have had constructed for me by Mr. R. Wappler a foot switch that operates most successfully.

Certain situations of these neoplasms, such as in the case mentioned above where four papillomata are located in a straight line on the median aspect of the vault of the bladder, may be found difficult of approach. The difficulty in this case has been readily overcome by pressure of the hand on the hypogastric region above. No prostatic malignancies, nor those in which the question of secondary invasions of the bladder arose are considered in this paper.

Physical Examination.—The rectal or vaginal examination should never be omitted in these cases. Catheterism is not of much value and is dangerous on account of hemorrhage and cystitis. The course of the condition is generally long, twelve to fifteen years. The frequency and abundance of hematuria, of course, plays the great rôle in duration. Death may at times take place from obstruction of the mouth of the ureter, provoking hydronephrosis or anuria, or a reflex anuria may supervene. Finally, the tumor may recur as a malignant one.

Recurrences as Malignancies.—Certain authors base their claims that the malignant tumors undergo their evolution on the spot, as they cannot be spread by means of lymphatics, there being none (?) in the bladder. This theory is based on the researches of Professor Sappey, who denies the existence of lymphatic vessels in the bladder coats. This idea has, however, been controverted by the work of M. and Mme. Hoggan, who have proved the existence of these vessels in the bladder. Other authors have claimed that these growths are in reality in their incipency benign tumors, and at a given moment become transformed into malignant ones.

Mortality.—Francis S. Watson (*Annals of Surgery*, December, 1905, *Operative Treatment of Tumors of the Bladder*) says "The sum and substance of the result of operative treatment up to the present time may be stated thus: if the operative deaths and rapid recurrences are combined under the head of 'operative failures,' such failures are seen to have occurred in 28.6 per cent. of cases in benign tumors, exclusive of myoma, and in 46 per cent. of cases of carcinoma."

According to the same author, out of 653 cases of all tumors operated upon, 243 were benign and 410 malignant. That the benign tumors recurred rapidly in 20.5 per cent., the carcinomatous in 26.8 per cent., and the sarcomatous in two to eight months in all except two out of fifty-two cases.

Conclusions.—That tumors of the bladder are translatable

by the symptomatic hematuria and other symptoms, which do not always permit clinically of a striking difference between them, inasmuch as a small papilloma may give rise to a fatal hematuria as well as a malignant one, seems established. However, one may arrive in certain cases at a precise diagnosis based upon the clinical evolution, the physical signs, and the examination of the fragments expelled. That the benign tumors may recur under two forms, first under the malignant form, a long period of time intervening before the recurrence; and it is a question whether the tumor beginning as a benign one has not become transformed into a malignant one. The actual state of our knowledge of the subject does not at this time permit of this conclusion. Second, a recurrence may take place after a long period of time as a benign one, as in two cases recorded by me with histological findings.

Guyon states the "the cases which I believe have permitted of this hypothesis of a transformation are very exceptional. I have already had an occasion to cite in studying the progress of neoplastic affections of the bladder many examples of vesical tumors of long duration, even up to twenty-seven years, which did not undergo malignant transformation. Consequently one should be very reserved in discussing the question of transformation of vesical growths."

60 WEST FIFTY-SECOND STREET.

DISCUSSION.

DR. JAMES EDGAR SADLER, of Poughkeepsie, New York, reported a case that recently came under his observation. The patient was a woman, sixty years of age, married, upon whom an operation was done for malignant disease of the breast five years ago. She recovered very nicely from this operation, and had been in good health until February of the past year. Since the operation was done she had removed to a distant part of the state, and when in February of this year severe bladder symptoms set in she applied for treatment to her physician and was treated by irrigation, internal medication, until the latter part of May of this year when she came to the speaker in a deplorable condition, with large quantities of pus and some blood in the urine, great vesical irritability, and having to get up anywhere from twenty to thirty times at night. Cystoscopic examination of the bladder showed a tumor on the right side, somewhat posterior, but well above the right ureteral orifice, the tumor being about the size of a silver dollar. It was protruding into the bladder and the surface had a sloughing appearance. Its base was thick and indurated. With an alligator forceps through a Kelly cystoscope

he was enabled to remove a fragment or two of the tumor which was pronounced to be an epithelioma undergoing carcinomatous change. In this case he tried the perineal operation suggested by Dr. Charles Mayo, and found it to be a comparatively easy operation. The patient was placed in the Trendelenburg position, the bladder walled off, and then from the inside the tumor excised. The patient made an uninterrupted recovery. A cystoscopic examination made within the last two weeks disclosed a perfectly normal bladder. He did not know what the ultimate outcome of this case would be, but the operation was a comparatively easy one, and the after-care was simple and recovery very nice.

DR. JOSEPH F. MCCARTHY, of New York, spoke of fulguration in reference to the growths mentioned by Dr. Erdmann, as he thought it offered a large field of usefulness in these cases. This subject was difficult from the standpoint of operative technic. Those who had had anything to do with these growths in the bladder knew that they recurred with great frequency, and after having seen a method of treating the smaller ones which did not involve a radical operative procedure, we should welcome it. Within the last few months Dr. Keyes and Beer, of New York, had treated these growths by fulguration or high frequency, and one case in the hospital, which Dr. Erdmann had referred to the speaker, he had treated by this method. The treatment may be carried on in the office by means of a cystoscope without any anesthesia, local or general, and in treating this case and in examining it he found that the growths had recurred at a site remote from where they were originally found by Dr. Erdmann. In one case the growths seemed to be in perfect line at the site of the incision in the flank, and on the superior wall of the bladder there were four growths, and one growth behind the vesical neck. These growths under four satisfactory treatments have practically disappeared. In fact, he should say they were gone. One growth was immediately behind the vesical neck, and he had great difficulty in approaching it.

DR. JOHN W. POUCHER, of Poughkeepsie, New York, had nothing to offer in the way of argument with reference to operative procedures for the removal of papilloma of the bladder, but desired to suggest a method he had tried very successfully in the treatment of urethral caruncle. He had treated urethral caruncle for the last five years with a strong solution of argyrol and had not failed in a single instance. He recalled one case on which he operated three times, and the condition recurred just as fast as it was removed. After perhaps a dozen or twenty applications of argyrol the caruncle disappeared, and it had not returned for the last five years. Since then he had treated every case of urethral caruncle that came under his observation with argyrol. The last case he treated by this means was one of papilloma of the urethra about the size of a small egg. This tumor had been dissipated so that there was nothing left but a red point not larger than a pea. While he had no theory to offer

for the dissipation of these growths by the application of argyrol, yet he urged the members to try it in cases of papilloma of the bladder.

DR. JOHN W. KEEFE, of Providence, Rhode Island, desired to say a word or two about the use of the cystoscope. In two cases where he had used the water cystoscope he had been unable to find tumors in the bladder on account of severe hemorrhage that occurred at the time. On the other hand, with the air cystoscope the growths could be readily seen.

With reference to the transperitoneal operation, it should be performed more often than the operation just above the pubes in the prevesical space, especially if the patient was fat, because we had a deep wound through which to operate. By placing the patient in the Trendelenburg position one could readily have access to the bladder. If he understood the description of Mayo's operation by the transperitoneal method, after placing the patient in the Trendelenburg position and walling off the intestines, he made an incision in the bladder in the median line and another incision was made to remove the growth, there being two openings in the mucous wall of the bladder. After making an opening in the abdominal cavity, the peritoneum covering the bladder could be separated from the bladder, as the peritoneum was separated from the bladder in doing a hysterectomy, and then by having a cystoscope in the bladder at the time the assistant could by viewing the growth force the cystoscope at a point so that one would know exactly where the growth was, grasp it with vulsella, and excise it. These wounds should be closed immediately, and in most of them there was primary union. The bladder could be drained by catheter. All of these growths were not malignant. Some of them might be tuberculous.

DR. LOUIS FRANK, of Louisville, said, with reference to tuberculosis of the bladder, it was an exceedingly rare disease as a primary lesion. It was always secondary to tuberculosis in other portions of the genitourinary tract. So true is this that we could practically always exclude it as a cause of bladder disease.

Several years ago he began to close the bladder primarily after a suprapubic operation. The first case was following the removal of a stone from the bladder. He had closed six or seven bladders following operations for the removal of stones. Most of these bladders were infected, and in every instance but one there was primary union. This procedure had been followed by some of his colleagues with the same gratifying result. Of course, where the bladder was badly infected it was not closed primarily, but where by irrigation one could bring about a fairly aseptic condition immediate closure of the bladder was practical.

His experience with regard to removal of tumors of the bladder was confined to one or two cases. In these he was able to bring the growth up by the vulsellum forceps so as to practically have

it extravascular, that is, up in the wound itself, the growths were excised, the base cauterized, and the bladder wall brought together and immediate closure effected with catheter kept in. One patient, operated on three or four years ago, had not thus far any recurrence.

PUERPERAL WOUND INTOXICATION AND WOUND INFECTION.¹

A HISTORICAL AND CRITICAL REVIEW OF CHILDBED FEVER.

BY

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St. Louis.

ISOLATED cases of puerperal fever and series of cases in the practice of single individuals have occurred at all times among civilized nations, but the dreadful epidemics of puerperal fever which carried off child-bearing women by the hundred thousand did not appear until the advent of lying-in hospitals. During the eighteenth century such hospitals were established all over Europe, although a few of these institutions are much older. Pregnant, parturient, and newly delivered women were now crowded together in close and unsanitary quarters, and during these dreadful epidemics it was common to find newly delivered women in the same room and often in the same bed with those dead or dying of septic infection.

When medical men began the study of pathological anatomy and when postmortem examinations became frequent the medical attendants became the principal carriers of infection. The more they engaged in the search after the cause of childbed fever, the more autopsies they held on women who had died of this disease, the more child-bearing women they infected. The total ignorance of the nature of infection led men who were engaged in obstetrical practice to perform or to attend these autopsies, to handle the viscera of the victims, to cut them out and to carry them home for further investigation, and immediately afterward to examine and to attend women in labor without changing their clothes and without more than a superficial washing of hands.

That this was the common state of affairs is illustrated by an article in the *London Medical Gazette*, December 10, 1831, in

¹ Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists held at Syracuse, September 20-22, 1910.

which Dr. Campbell of Edinburgh states that in October, 1821, he assisted at the postmortem of a patient who died of puerperal fever. He carried the pelvic viscera in his pocket to the classroom. The same evening he attended a woman in labor without previously changing his clothes; this patient died. The next morning he delivered a woman with forceps; she died also: and of many others who were seized with the disease within a few weeks three shared the same fate in succession. In June, 1823, he assisted some of his pupils at the autopsy of a case of puerperal fever. He was unable to wash his hands with proper care, for want of the necessary accommodations. On getting home he found that two patients required his assistance. He went without further ablution or changing his clothes; both these patients died with puerperal fever.

In the early part of the nineteenth century now and then, especially in England, voices were raised suggesting that, in some cases at least, the disease might be contagious, and likewise pointing out the apparent relation between puerperal fever and erysipelas, but they were not heeded.

In 1843 Oliver Wendell Holmes published his essay, "The Contagiousness of Puerperal Fever." He had collected an abundance of damaging evidence and arranged it into a most convincing indictment of the medical profession; he did not ask for conviction and punishment for past wrongs committed in ignorance, but he pleaded most eloquently on behalf of the prospective mothers that, for the future, negligence of proper care in preventing infection be considered criminal. Holmes' appeal to the medical profession was lost, partly on account of the bitter war waged on him and his idea of contagiousness by two leading American obstetricians of the period, Meigs and Hodge, and partly because bacteriology was at the time an undiscovered land, some knowledge of which was indispensable for an understanding of the nature of infection.

Four years later, in 1847, Semmelweis again pointed out the contagiousness of puerperal fever and, although he demonstrated the correctness of his views by reducing the mortality from puerperal fever in the maternity clinics of Vienna, he, likewise, failed to convince the medical profession and he was ridiculed and persecuted. As late as the year 1861 the great Virchow attacked and ridiculed the idea that childbed fever could be contagious.

The avoidable sacrifice of hundreds of thousands of women

went on until finally the advent of Lister and of the antiseptic time, together with the establishment of bacteriology, prepared the medical world for an understanding of the nature of puerperal infection. The old-time epidemics now disappeared, but isolated cases of severe infection and numerous cases of localized infection continued to appear in the best-managed maternity hospitals.

When the writer first became acquainted with German university clinics, in 1879, the antiseptic era was in full bloom; pathogenic germs were suspected everywhere, but their distinctive characteristics were known to very few besides Pasteur and Koch; the means of disinfecting hands and instruments were inadequate, and the teachers had plenty of material to illustrate every form of puerperal infection, like puerperal ulcers, parametritis, perimetritis, phlebothrombosis, and mammary abscess; the severer forms of infection—namely, general peritonitis, pyemia, and general sepsis—were rare, but they were not entirely absent.

The year 1881 worked a sudden change; in that year appeared the first volume of the "Communications from the Imperial Health Bureau." Among a dozen epoch-making articles it contained one by Robert Koch on examination of pathogenic organisms, giving clear instructions about staining bacteria, about pure cultures, and about inoculation; it likewise contained a number of articles on disinfectants and disinfection by Koch and his associates, proving the immense superiority of bichloride of mercury over all disinfectants in use at that time. Bichloride of mercury was now introduced as the main antiseptic agent, both for disinfecting the hands and for douches and dressings; the systematic study of bacteria soon brought order out of chaos; the carbolic spray disappeared, and the antiseptic era was followed by the aseptic one.

Septic infections of any kind now disappeared entirely from the modern maternity hospital; the older classification of the various forms of infection was gradually given up and bacteriological classification took its place. The terms autoinfection and heteroinfection are at present no longer used in the sense in which Semmelweis applied them, and it might be best to drop them from our text-books for the sake of simplicity in teaching. Semmelweis spoke of autoinfection when dead material, such as pieces of placenta or membranes, were retained in the parturient

canal and by their decomposition caused fever. We prefer to speak of this condition as

WOUND INTOXICATION OR SAPREMIA.

The uterine cavity, under normal conditions, is germ-free, while the lower cervix and the vagina harbor a rich flora of germs of all kinds; all of these germs are saprophytic in character, even if their form is identical with that of pathogenic germs. Any of them, like the hemolytic streptococcus, may at one time have been pathogenic to man, but when found as normal dwellers in the vagina they have lost their virulence and are for the time being saprophytes pure and simple. Were it otherwise, how could the almost entire absence of infection in well-regulated maternities be explained, especially when in most of them no attempts are made to sterilize the parturient canal.

The wound intoxication and the fever are due to the absorption of a chemical poison from the parturient canal, generated by the activity of saprophytes in decomposing dead material. With the removal of this dead material no more of this poison can be formed, and when the system gets rid of the poison already absorbed the patient is cured.

By heteroinfection Semmelweis meant that the virus had been carried to the patient from without; we prefer to speak simply of puerperal wound infection.

PUERPERAL WOUND INFECTION.

In this form the germs enter the living tissues to a greater or lesser depth and multiply in them according to their characteristic habits and to the degree of their virulence. Thus it is characteristic for the bacillus of diphtheria, the tetanus bacillus, and the colon bacillus, as a rule, to develop their colonies near the surface of lining membranes and wounds, while streptococci and staphylococci enter the tissues according to the degree of virulence they possess and the degree of resistance which the tissues offer. Greater virulence does not mean that the respective germ secretes a more potent poison than a germ of lesser virulence but it means that the germ possesses a greater tolerance against the natural and the special antibodies of the human system.

The variation in the degree of virulence is readily studied in the streptococcus, while various germs and combination of

germs are found to be the cause of the different forms of puerperal infection, but there is hardly one clinical picture of wound infection which the streptococci are not able to produce by themselves. Their virulence changes according to the culture medium in which they grow; roughly speaking, the virulence decreases when the streptococci grow outside of the animal body, and it increases or is restored when they are transplanted from animal to animal.

The dirt that surrounds many parturient women of the lower classes contains, among other germs, plenty of streptococci, but their virulence is low because they have grown outside of the animal body for some time. When brought in contact with the parturient canal they may cause infection of the lacerated perineum and form puerperal ulcers; or they may enter a little deeper and cause a septic cellulitis or even a pelvic peritonitis. These patients usually recover and they seem to develop a certain degree of immunity; this explains why, during the antiseptic period, when there was still considerable mortality from abdominal operations, the operators were a little afraid of the so-called virgin peritoneum and had less fear of infection in women who had passed through pelvic inflammatory troubles.

When, on the other hand, highly virulent streptococci are brought in contact with the parturient canal of the lying-in woman, they at once enter deeply into the tissues where they multiply rapidly, causing general peritonitis, pyemia, or general sepsis. These highly virulent germs are always brought to the patient by the obstetrician or by the nurse; they are often fatal and they are always avoidable except in rare cases in which gonococcus infection follows the bursting of a tube or the squeezing out of its contents during labor, or in which a tubercular focus leads to a general infection.

Puerperal infections are most frequently caused by streptococci, staphylococci, and the colon bacillus, and less frequently by the gonococcus, the pneumococcus, the bacillus of diphtheria, and other germs. It is desirable to make a bacteriological diagnosis whenever that is possible, but in general practice it cannot always be done, nor is it necessary in the localized processes; and it would be well if teachers and writers would adhere to the old classification and divide all infections into the more or less localized infections which usually get well and into the general infections which are often fatal.

LOCALIZED INFECTIONS.

1. Puerperal Ulcer. 2. Puerperal Endometritis. 3. Puerperal Parametritis. 4. Puerperal Perimetritis. 5. Phlebotrombosis.

GENERAL INFECTIONS.

1. General Peritonitis. 2. Pyemia. 3. General Sepsis (Bacteremia).

The teachings of Semmelweis are now duly appreciated. Hungary, his native country, has honored his memory by having his ashes removed from Vienna and deposited in an honor grave, which the city of Budapest gave for that purpose. This grave is graced by a suitable monument; a table has been placed on the house in which Semmelweis was born; a grand Semmelweis monument has been erected on one of the finest public squares of Budapest. The means for this monument were raised by international subscriptions; the unveiling of the monument took place on September 30, 1906, and was the occasion of a grand international gathering of obstetricians; the final report of how the medical profession of Hungary has honored itself by honoring Semmelweis was presented last fall to all the members of the gynecological section of the international congress, that they might spread the fame of Semmelweis over all parts of the globe.

In the meantime the medical profession of the United States has almost forgotten that Oliver Wendell Holmes has equal, if not greater, claim to be remembered as the discoverer of the contagiousness of puerperal fever. Most of our text-books mention the work of Semmelweis, but do not mention that of Holmes, at least not in an adequate manner; the one pleasing exception being the text-book of Barton Cooke Hirst, who does full justice to Dr. Holmes.

It is true, the memory of Dr. Holmes will always be kept green on account of his prominence in literature and he can afford to do without special honors for his achievements in medicine; but can the medical profession of the United States afford to neglect his claims for universal recognition as the discoverer of the cause of childbed fever and the means of preventing it?

While we deplore the untimely death of the hundreds of thousands of young child-bearing women whose lives would have

been saved if the appeals of Holmes and of Semmelweis had been heeded by their contemporaries, we excuse the medical profession of that day, however, because without a knowledge of bacteriology we could not expect it to understand the apostles of the new doctrine. No such excuse can be made for the medical profession of to-day; it is fully acquainted with the nature of infection and it possesses reliable means for preventing it, yet the fact remains that in the United States, in Germany, and in other countries thousands of young women die every year from puerperal infection whose lives could have been saved.

MIDWIVES.

In the United States two factors seem to be responsible for this deplorable state of affairs; the one is found in the inadequate obstetrical training which the average American physician receives before he engages in obstetrical practice and the other factor is the untrained and irresponsible midwife. Until recently a good many of our medical schools failed to provide bedside teaching in obstetrics, but conditions are getting better and it seems likely that before long in every part of the United States state boards of examiners will have the power to deny the right to accord state board examinations to graduates of medical schools which fail to furnish a reasonable amount of obstetrical bedside teaching. There is, likewise, reason to hope that these examinations will be made both theoretical and practical.

But assuming that within a reasonable time the obstetrical training of every American physician will be efficient, the yearly loss of thousands of women from childbed fever whose lives could be saved must continue, because a great number, in many localities the greater number, of women are during confinement attended not by members of the medical profession, but by midwives, and because these midwives are, with rare exceptions, permitted to do this work without giving an account of their education and obstetrical training and without state supervision.

In St. Louis out of a yearly average of 15,000 confinements about 7,800 are attended by midwives, and similar conditions exist in other large cities; in smaller cities and in the country the midwives do a large amount of the obstetrical work, but they do not predominate. To say that we do not want midwives in the

United States is nonsense; they are badly needed and, if properly educated and controlled, they can be a blessing to that part of the population which cannot afford to pay for a nurse, let alone paying for a doctor. A good midwife will take care of normal cases and will act as visiting nurse after delivery and she will do all this for a small fee.

It is our duty to secure the enactment of laws which will regulate and supervise the practice of midwives; their schools should be forced to come up to reasonable minimum requirements; they should be registered on a license obtained by passing a state examination; they should be under strict supervision of the health officers; the scope of their work should be clearly defined; it should be prescribed what implements and material they have to take along to each case and what antiseptic and aseptic measures they must employ; once a year they should be called to the county seat to receive printed instructions and to have these explained.

If this were done the midwives would cease to be the curse which they at present undoubtedly are. The fault, however, rests with the public and the medical profession; the latter should enlighten the former on the situation, which is a danger to public health, and both the public and the medical profession should work together to secure the enactment of much needed laws to regulate the practice of midwives.

If we look over the medical laws of every state and territory in the United States we will find that Louisiana, Missouri, Ohio, Wyoming, Utah, and the Philippine Islands stand alone in requiring an examination of midwives and in providing a fine for practising without a license. Ohio limits the work of the midwives, but nowhere has a state board control over the schools. Louisiana makes special mention that the so-called midwife of the rural district and plantation is not considered as practising midwifery as a profession.

All the rest of the states simply ignore the question with two notable exceptions. Mississippi and Maine do not ignore them, but insist that midwives have a right to practise without license or control. The law of Maine says: "This act shall not apply to midwives, who lay no claim to the title of physician or doctor," and the law of Mississippi reads: "Females engaged in the practice of midwifery are not prohibited from such practice, but are entitled to engage therein without a license."

SERUM THERAPY AND BACTERIAL VACCINES IN THE
TREATMENT OF PUERPERAL SEPTICEMIA.¹

BY

HENRY SCHWARZ, M. D.,

St. Louis.

THE introduction of serum therapy into obstetrical practice dates back to the year 1895, when Marmoreck's antistreptococcic serum was placed upon the market. Long before that time we had learned that more or less localized puerperal infections cannot always be prevented, but that with rational treatment they usually get well; we had learned that in the severe forms of general infection the germs are almost always carried to the patient by doctor or midwife and we had learned that these cases usually prove fatal, no matter what therapeutic measures we employ.

In our own private and hospital practice cases of severe infection were unknown, but we saw in consultation or had brought into our hospitals cases of severe puerperal infection due to the ignorance or criminal negligence of the obstetrical attendants. We tried to reduce the number of these cases by providing for a better obstetrical training in our medical schools, and by agitating the enactment of laws to regulate the practice of medicine and midwifery.

When antistreptococcic serum was placed at our disposal we hoped that it might cure some of the heretofore hopeless cases, but we soon found out that it failed to do so. Personally, I felt hopeful because in 1896 I used it in a case of severe pyemia and the patient recovered; no bacteriological diagnosis was made in that case. Since that time I have used the various antistreptococcic sera in many cases of severe streptococcus infection in which the diagnosis was based on cultures from the patient's

¹Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists at Syracuse, September 20-22, 1910.

blood and without a single exception these cases have died; of course streptococci are found in the blood in the partly localized infections oftener than was formerly supposed, but I did not employ serum treatment in these cases.

While continuously improving obstetrical asepsis by the use of rubber gloves and other means, we continued the use of anti-streptococcic serum in these hopeless cases because we have neither the right nor the heart to let a young mother die without keeping up the fight for her life to the very last and because theoretically antistreptococcic serum is the logical remedy in these cases; and we still hope that the manufacturer may some day supply us with an effective serum.

Such was the state of affairs when bacterial vaccines were recommended for the treatment of puerperal infections; stock vaccines were placed upon the market and the practitioner was asked to use them. Before long it was claimed that they worked wonders in the severe acute forms of infections and practitioners began to use them indiscriminately. About a year ago I became alarmed over this indiscriminate use of bacterial vaccines; I feared that the vaccines would be used in sapremic cases and in cases of mild infection and thereby gain a reputation which they did not deserve, and that the failure to cure cases of acute infection would prejudice against their employment in their legitimate field of chronic infection and prophylactic vaccination; and I also feared that the marketing of bacterial vaccines would prove so easy and so profitable to the manufacturer that he would give up all attempts of providing us with a better serum. Therefore I warned against the use of bacterial vaccines in cases of acute puerperal septicemia in a paper read before the Saint Louis Medical Society last April which was published in the bulletin of that society April 30, 1910.

I argued that the use of these vaccines in acute cases was ill advised; that their use in the partly localized puerperal infection required great caution because an excessive negative phase might prove disastrous, and I insisted on the necessity of bacteriological diagnosis in every case. Since that time several publications have appeared advocating the use of vaccines in the most fulminating forms of infection, notable among which is the article of Dr. Deaver in the August number of *Surgery, Obstetrics and Gynecology*. Deaver has used autogenous vaccines in acute cases of streptococcus and staphylococcus infections. The streptococcus infections died promptly as was to be expected;

the staphylococcus cases recovered, but I suppose that this was due to the other measures employed and to the fact that they are naturally less fatal.

The report of the committee of the American Gynecological Society on the value of bacterial vaccines in obstetrical and gynecological practice, read at the meeting of that society in May and published in July of the present year, is very conservative and concludes by stating, "It would appear that the greatest prospect for its successful use is in chronic local infections, and that it offers very little hope in acute general infections where aid is so urgently needed."

If bacterial vaccines can cure acute infections it ought to be easy to prove the fact by animal experiment. I therefore made the attempt to ascertain the curative and prophylactic value of streptococcus vaccines in rabbits. It is well known how susceptible rabbits are to streptococcic infection; in fact manufacturers increase the virulence of their strains by passing them through rabbits before inoculating horses with them.

Not wishing to repeat experiments which I supposed might already be on record I asked Parke, Davis & Company and the H. Mulford Company for information on this point and solicited their cooperation. Neither of them had records of such experiments. I therefore asked Dr. C. Fisch of St. Louis, a competent bacteriologist, to make the experiments for me and Dr. A. P. Hitchens, director of the Mulford Company's biological laboratories at Glenolden kindly volunteered to repeat and extend them. In the experiments conducted by Dr. Fisch the strain of streptococcus used was kindly furnished by Parke, Davis & Company.

From a twenty-four-hour serum-agar culture emulsions were made by emulsifying one loop of culture (always the same loop, holding about 1 mg.) with 10 c.c. of salt solution. The number of colonies in 0.0001 c.c. of this emulsion was 1500; for vaccine preparation the emulsion was heated to 58° C.; the time for heating was one hour; cultures made from the heated emulsion were always negative; it was found in the preliminary tests that 0.1 c.c. of emulsion would kill an average rabbit in three days, corresponding in time to the fatal streptococcic infections in man. This quantity of emulsion was therefore used in the inoculation of the animals during these experiments.

The autopsies were limited to the examination of the blood drawn from the heart of the animal soon after death; all cultures

showed streptococci. The vaccinations were made intravenously, intraperitoneally, and subcutaneously. The experiments are not quite completed and the detailed data will not be published until final reports are received from both Dr. Fisch and Dr. Hitchens. The results so far reached are these:

1. Vaccination after inoculation has no influence on the infection; all animals died in three days, the same as the control animals.

2. Vaccination simultaneous with inoculation has no influence on the infection.

3. Prophylactic vaccination produces immunity, but it must extend over a considerable period and vaccination must be stopped ten days before inoculation.

On July 24, 1910, systematic vaccination of nine rabbits was started by beginning with 50,000 killed streptococci and repeating vaccination every four days in increasing doses until by August 28 three millions were reached; three of the animals were vaccinated subcutaneously, three intravenously, and three intraperitoneally. In two animals from each series vaccination was stopped August 28, and on September 7 all six of them together with a control animal were inoculated with 0.1 c.c. of the virulent emulsion with the following results:

Rabbit No. 20.—The control died after three days as usual.

Rabbit No. 14.—Intraperitoneal series died after four days.

Rabbit No. 15.—Intraperitoneal series died after five days.

Rabbit No. 16.—Intravenous series died after five days.

Rabbit No. 17.—Intravenous series died after five days.

Rabbit No. 18.—Subcutaneous series alive and well after eight days.

Rabbit No. 19.—Subcutaneous series alive and well after eight days.

In all animals which died the blood contained streptococci, while blood taken from the ear of the two surviving rabbits proved sterile. It seems that intravenous and intraperitoneal vaccinations are worthless, although they did change the course of infection from three to five days. We were unable to find ill effects from the excessive use of bacterial vaccines in normal rabbits; 50,000,000 caused no disturbance, while 200,000,000 made the animal sick for a few days so that it refused food.

Although these experiments are at present far from complete, I venture to make the following suggestions regarding the use of bacterial vaccines in puerperal infections:

1. The employment of bacterial vaccines must be based on bacteriological diagnosis.

2. In the more or less localized infections, such as those of the urinary tracts by the colon bacillus, pelvic inflammation caused by the gonococcus and the various staphylococcus infections, vaccines treatment has a legitimate field and can accomplish much for good.

3. In strictly local streptococcus infection the use of vaccines is unnecessary, while in partly localized streptococcus infections the use of vaccines is dangerous.

4. In acute infections of any kind the use of bacterial vaccines is contraindicated.

5. Prophylactic vaccination against streptococcus infection is possible, but it must be started many months before the patient is exposed to infection.

In regard to antistreptococcic serum and antistaphylococcic serum I would suggest that they find logical employment in acute infections of their respective germs, and that manufacturers should try to provide us with sera which have been tested as to their animal efficiency; this is done with some of the best sera in the European markets and they seem to give results not quite as hopeless as do the sera at present manufactured in the United States.

440 NORTH NEWSTEAD AVENUE.

DISCUSSION.

DR. E. GUSTAV ZINKE, of Cincinnati, Ohio, said the members had listened with delight to a magnificent exposition of the progress of gynecology, obstetrics, and abdominal surgery. Dr. Schwarz had been at work for many weeks and months to prepare both of these papers and had given a clear idea of what puerperal fever really meant. The puerperal fever of to-day was a clear-cut picture. It was no longer the wilderness that was depicted twenty-five or thirty years ago. When the speaker was a medical student every obstetric teacher had his own explanation of puerperal fever. Some of these teachers took great delight in differing with each other; but to-day those who studied the subject thoroughly would invariably be able to determine the character of the infection which befell their unfortunate patients. It was true, prophylaxis was of the greatest importance here, as it was in every other infection, but a recognition of the nature of the infection dictated the treatment to be pursued. The essayist had spoken of puerperal or wound intoxication which was the result of the action of the saprophytes or so-called saprophytic infection. This infection invariably

was characterized by a slow rise in temperature, and sometimes for days this elevation of temperature would continue and the pulse remain normal, and this was a pathognomonic symptom of this form of puerperal fever. It did not mean much if the obstetrician recognized the condition and instituted proper care, as the patient could be relieved of her trouble within half an hour by simply irrigating the parturient tract and washing away the necrotic tissues. Neither the dull nor sharp curet should be used unless it was known that the uterine cavity contained a large amount of placental debris or membranes. This could be determined by an examination of the placenta and membranes after the labor had been completed. A temperature which rose slowly and within a few hours or days the pulse began to go up slowly, yet was full and good and regular, meant prompt and gentle cleansing of the parturient tract. This being done, the temperature would go down almost immediately, and the patient would be relieved for good in the majority of cases. In some cases this procedure might have to be repeated within twenty-four or forty-eight hours, or three days, depending on how much was left in the parturient tract.

DR. J. H. CARSTENS, of Detroit, said there was something still obscure about puerperal septicemia. One might talk about saprophytic infection, streptococcus infection, gonorrheal infection, and diphtheria infection, but still the really bad cases of puerperal infection were in women who had absolutely no physical signs. The woman would go on week after week for six and seven weeks with a temperature varying from 105 to 107°. Perhaps the only symptoms manifested were those of nervousness and restlessness. Such cases would go on sometimes week after week and recover, while others would die. Probably 30 per cent. of them would die and the rest of them would get well. What was it? It was not staphylococcic, streptococcic, gonorrheal, diphtheritic, or colon bacillus infection. It was something we did not know—at least he did not. He held that there was some specific micro-organism that caused a virulent kind of puerperal fever, and that this organism had not been isolated.

DR. F. W. SEARS, of Syracuse, New York, stated that Dr. Zinke had given a clear picture of puerperal septic infection. The speaker in his early practice had one of the cases that had been described, and the patient was turned over to him to die. He had gone over the history of obstetrics from the time of Semmelweis down and was convinced that this was a case that could be cured, and the patient got well by irrigating the uterine cavity. When he presented the facts of this case before the Onondaga County Medical Society and advocated this treatment he was very much opposed, as this was the first time that irrigation of the uterus for this condition was practised, so far as he knew. This was twenty-four years ago.

DR. THERESA BANNAN, of Syracuse, New York, said there were two points she would like to bring out in regard to prophylaxis which appeared to her of some weight. The first was the third

stage of labor with the Credé method and prolonged massage at least an hour after the expulsion of the placenta. As to the second point, she did not know how extensively it was permitted in the practice of Drs. Schwarz and Zinke, but the second measure was to see that massage of the uterus was continued through the puerperium. The nurse could practise this to keep up the tone of the uterus in order that it might not relax after labor. The other point was to allow the patient to get up to answer the calls of nature.

With respect to pelvic drainage, while it would seem to be indicated following labor, yet she would be interested to know whether it was customary in the practice of physicians to keep patients in bed and to catheterize them, as she had done in the first five years of her practice, but which she never did now under any circumstances.

DR. JOSEPH PRICE, of Philadelphia, remembered very well the utterance of Dr. McMurtry about one-quarter of a century ago when he suggested that the puerperal woman should be treated precisely as we would treat a surgical case; in other words, that precisely the same preparations should be made to deliver the pregnant woman that were made for the removal of a cystoma or fibroid tumor. The practice of Rohe, of Baltimore, the practice at the Sloane Maternity, and the practice at the Preston Retreat when the speaker was connected with the latter institution were followed by the same gratifying results in the same institutions, reducing the mortality from puerperal infection to *nil*, and demonstrating that the advice given by McMurtry was trite. The practice of examining these women by practitioners without making proper toilets should be condemned.

DR. ROLAND E. SKEEL, of Cleveland, Ohio, said the great difficulty was that members of the association were not handling all the obstetrical cases of the country. The mortality rate from puerperal sepsis was high and it was the disgrace of the profession, but were the members of the profession as a whole to blame for it? It should be remembered that a large number of practitioners who were called upon to do obstetric work likewise treated cases of scarlet fever, erysipelas, opened abscesses, etc., and as they were not paid very much for their obstetrical work they would say they could not afford to spend much time in washing their hands and in trying to make themselves thoroughly clean and aseptic. Nature was very kind, for all women did not die who were treated by practitioners who had not made a proper aseptic toilet. He thought obstetrics was as well taught in medical colleges to-day as any other department of surgery, but all practitioners failed to heed the instruction and advice given them by their teachers.

DR. J. GARLAND SHERRILL, of Louisville, read a paper entitled
ADENOCARCINOMA OF THE KIDNEY.¹

DISCUSSION.

DR. JOHN F. ERDMANN, of New York, reported five cases of tumor of the kidney on which he had operated, four being hypernephromata, and one recently of large sarcoma of the kidney. Each case was reported in detail.

DR. LEWIS S. MCMURTRY, of Louisville, alluded to the pathology, saying he thought it was very useful if the analogy between the relation of stones in the kidney and the development of malignant disease could be established. There seemed to be in the kidney, with the presence and irritation of stones, on account of the different character of tissue and the different function of that tissue, a greater disposition to suppuration than to malignant disease, whereas in the gall-bladder we could regard it now as thoroughly established that the irritation of gallstones was a distinct factor in the development of malignant changes.

DR. SHERRILL, in closing the discussion, said that Dr. McMurtry probably would recall a case which he saw with him where a kidney, the seat of stone, was removed and where a diagnosis had been made by another surgeon of sarcoma. Dr. McMurtry, not agreeing with this diagnosis, removed the enlarged kidney and found it to be lipomatous, the kidney full of new fatty tissue which was displacing the kidney structure, and in this structure were found a number of stones, so that while it was not proven that calculus had any effect in the production of malignant growths or changes it was evident that new growth did develop from the irritation produced by calculi. In this instance the growth was benign.

DR. FRANCIS REDER, of St. Louis, Missouri, read a paper entitled

THE BREAST OF THE EXPECTANT MOTHER; ITS CARE BEFORE AND DURING THE PERIOD OF LACTATION.¹

DISCUSSION.

DR. THERESA BANNAN, of Syracuse, had been looking for milk fever for twenty years in her practice and had not found it. She did not believe Dr. Reder found it.

The question of the care of the nipple of the expectant mother was of far-reaching importance. It solved 50 per cent. of the problem of pure milk. It meant not only safety and health to the mother, but the life of the first child when most of the difficulties arose, and of all her subsequent children. If there was a disturbance from the neglect of the ordinary precautions of cleanliness the mammary gland was made a pathological organ,

¹ To appear later in this Journal.

incapable of performing its function and condemning the child to the discomfort of artificial feeding. The causes of these things were multiple. In the first place, the majority of complications of the mammary gland occurred in the first pregnancy. The girl was very often modest—in fact so much so, that she did not keep her genital organs, including the mammary glands and the nipple, in a cleanly condition, and therefore incrustations were formed from the oozing of the milk. These women should receive preliminary care, consisting of friction of the mammary nipple and perhaps the use of alcohol, because the human mind is so constituted that if one gives something to rub on other than soap and water it has a greater effect. She thought if much of the energy which was spent on the question of certified milk was devoted to the instruction and the care of the expectant mother, according to the means just laid down, we would be doing more for the health of our babies and our women.

DR. WILLIAM G. DICE, of Toledo, thought most patients were willing to take proper care of the breasts if they were given proper instruction. He did not recall seeing in his own practice more than two cases of abscess of the breast in ten years. There was one thing which the practitioner did see occasionally, and that was marked engorgement of the breast on the third day. This engorgement could be prevented or greatly lessened by withholding liquids from the time of labor.

DR. ABRAHAM J. RONGY, of New York, in a record of 6,000 cases, both in hospital and maternity work, did not recall a case of suppurative mastitis. It seemed to him that the trouble with engorged breasts or with so-called milk fever was a question of doing too much for the patient rather than doing too little. Massage, the application of hot poultices, the use of the breast pump, made more mastitis than any other factors. In the service of Dr. Waldo, at Lebanon Hospital, the plan of treating these cases was simple. The breast of the mother was never massaged, nor was the breast pump used. To encourage the breast they put two or three more babies to it which would relieve the engorgement. Of course, in private practice, this was hard to carry out. The nurse was instructed in the maternity when the mother's breast was engorged to put on one or two babies to that breast and in six or seven hours the breast was practically healthy and the woman was relieved.

DR. J. H. CARSTENS, of Detroit, said that the essayist emphasized the point of having the breast of the mother prepared to do its work when the time came. These women neglected to call a doctor, and if they did the doctor neglected to look at their breasts, examine them, and find out whether they were in condition and what was to be done. He could endorse everything Dr. Reder had said; the way to make things strong was by working, by exercise. This would toughen the nipple and make it harder. He objected decidedly to applying alcohol or tannic acid or other astringents to the breast with a view of

toughening it. He thought the nipple should be soft and pliable and toughened by exercise, because this was what it was subjected to afterward.

DR. REDER, in closing the discussion, said, with reference to using alcohol, he employed it occasionally, but it was very rarely that it was used, and only when the nipple was sensitive and did not yield to the massage.

So far as encouragement of the breast was concerned; in St. Louis they could not get three or four babies at the disposal of the woman all the time.

DR. JOHN W. POUCHER, of Poughkeepsie, New York, read a paper entitled

ACUTE PANCREATITIS.¹

DR. JOHN W. KEEFE, of Providence, Rhode Island, read a paper on

ACUTE HEMORRHAGIC PANCREATITIS, WITH REPORT OF CASES.¹

DISCUSSION.

These two papers were discussed together.

DR. ROBERT T. MORRIS, of New York, stated that up to ten years ago he had not had any cases of pancreatitis, but he had lost three or four patients from this condition during the past year. This did not mean an increase in these cases, but it cast a reflection on his diagnostic acumen in former years. Pancreatitis was one of the commonest and most serious complications of cases of gall-bladder disease; no matter whether they were operative or not, and no matter whether gallstones were present or not, it was one of the most common and serious complications, and this fact must be recognized. Ascending infection could occur along the common bile duct, and this infection made its way against the epithelium which was supposed to keep the current moving toward the bowel continuously. In the same way we might have an ascending infection of the ducts of Wirsung and Santorini, and mere swelling of the mucosa of these ducts would suffice to dam the secretion of the pancreas, and then we had the picture so well brought out by the readers of these papers. We should operate just as soon as we were sure that pancreatitis was present, and it was important to establish drainage on both sides of the pancreas, for it was the vitiated secretion which was escaping that was doing the damage.

DR. LOUIS FRANK, of Louisville, had a personal experience of six cases on which he had operated, and was associated with another practitioner in one additional case. Dr. Keefe had

¹ To appear later in this Journal.

detailed the symptoms of the disease exactly as he had seen them, so that there was nothing left to be said on that phase of the subject. He impressed upon the members the profound shock that occurred in these cases. Every one of these cases presented to him the symptoms of upper abdominal perforation, except in a more marked degree. Shock had been the most pronounced symptom, prolonged, and from which these patients did not seem to rally.

Dr. Frank then detailed the cases that had come under his observation.

DR. CHARLES N. SMITH, of Toledo, Ohio, had had the opportunity of operating on four cases of acute hemorrhagic pancreatitis, in three of which the diagnosis had been previously made. In the fourth a diagnosis of perforative duodenal ulcer was made by mistake, and this patient died. These cases of acute hemorrhagic pancreatitis, as well as the cases of the chronic form of inflammation, were in 80 per cent. of the cases secondary to gall tract disease, and this very fact should lead us in the presence of acute symptoms of perforation into the upper peritoneal cavity to suspect one of two conditions, either perforation of the gall-bladder or acute hemorrhagic pancreatitis. In these cases of acute hemorrhagic pancreatitis he had found two varieties, one the fulminating variety, where everything went to the bad rapidly. The other class of cases was more slow in progress, and one of these he operated upon the fourth day of the hemorrhage.

Dr. JOHN F. ERDMANN, of New York, stated that his original thesis for admission to this Association contained a report of five cases of acute hemorrhagic pancreatitis. This was in 1906. Since that time he had added five more cases. These cases were summarized by him.

Dr. HUGO O. PANTZER, of Indianapolis, had had some ten or twelve cases of this disease, and in the majority of them he had noticed a sign of pathognomonic importance—namely, the peculiar chicken-coop odor these patients had. In some of them the odor was exceedingly offensive. This had not only been observed by him, but by the friends of the patients. One patient he had operated on three times. The case was operated on promptly as one of acute localized hemorrhagic pancreatitis. He found the gall-bladder and pancreas without any obstruction, opened the gall-bladder, and removed black greenish bile. The patient was operated on twice since, and each time the gall-bladder contained some stones. Dr. Smith had spoken about pseudo-obstructive intestinal lesions present in these cases and presenting a symptomatology suggestive of intestinal obstruction. Quite contrary to Dr. Smith's experience, the speaker's patients could not be purged by any remedies given.

Dr. POUCHER, in closing the discussion on his part, stated that a few days ago he opened the abdomen of a patient thinking that probably he had another case of acute pancreatitis. He

found, however, that there was a very large dropsical gall-bladder. The gall-bladder was very much inflamed. The omentum was thickened and infiltrated, covering the entire gall-bladder. He separated a number of adhesions, aspirated, opened the gall-bladder, and drained it, leaving the adhesions. Ten days later he opened the wound again to relieve a condition of constriction which he found to be a stone in the cystic duct, but much to his surprise he found a normal omentum, and all the adhesions which had previously existed had disappeared, except a few narrow strips which were easily removed, and it struck him that opening freely into the lesser peritoneal cavity and packing well with gauze and using a large tube would be good treatment. In one case, where he did not have a tube large enough, he used two in order to get free drainage, and with these the congestion of the pancreas as well as the congestion of the surrounding parts rapidly disappeared.

DR. KEEFE, in closing the discussion, said that Dr. Frank had called his attention to a matter of great importance—namely, a number of experiments had been made on animals and the pancreatic juice permitted to enter the peritoneal cavity without producing peritonitis, and as the pancreas was located retroperitoneally, toxemia occurred from absorption in that area and not in the lesser peritoneal cavity, and so he (Frank) suggested that when we drain the retroperitoneal space that it was of more importance than to drain the lesser peritoneal cavity. These cases were seen when secondary changes had taken place, and then draining the lesser peritoneal cavity was not sufficient because the pancreas had practically sloughed into the lesser peritoneal cavity. But in the early stages one could make a large incision in front and go into the lesser peritoneal cavity, and then open into the retroperitoneal space and drain freely in that position. This was not a septic process in the beginning, it was only later that sepsis occurred.

DR. THOMAS B. NOBLE, of Indianapolis, Indiana, read a paper entitled

TWO CASES OF PERFORATIVE GASTRIC ULCER.¹

DISCUSSION.

DR. CHARLES L. BONIFIELD, of Cincinnati, said his personal experience had been confined to two cases. One of them occurred two or three years ago. A large ulcer was diagnosed, but the patient did not come under his care until perforation had existed for a number of hours. He found the abdomen contaminated with all sorts of food and containing pus. He closed the perforation with considerable difficulty. It was in the lesser curvature of the stomach, and the patient only

¹ To appear later in this Journal.

lived ten or twelve hours. The last case was one which showed a difference in the ease with which these cases could be treated. The man was forty-five years of age and had been treated for gastric ulcer, being placed on a restricted diet. Just as he was coming out of the theater one afternoon he was seized with a severe pain in the region of the stomach. He then remembered the doctor had told him to restrict his diet, and to send for him in case of trouble. The doctor was sent for, immediately made a diagnosis of perforation, and telephoned the speaker before he got the patient to the hospital. He went over and operated on this patient in about two hours from the time the perforation occurred. Fortunately the patient's stomach was comparatively empty and there was very little debris in the peritoneal cavity. The ulcer was closed as rapidly as possible, drainage was put in, and his recovery was absolutely uneventful.

DR. J. H. CARSTENS, of Detroit, recalled a case of perforation from an ulcer an inch and a half long and an inch across. He sewed it up and the patient recovered. She had been operated upon one year before and a gastroenterostomy done to cure the gastric ulcer. Gastroenterostomy for ulcer of the stomach was in his judgment a poor method of treatment, because it had been found by experience that this operation did not do any good. If one operated he should tackle the stomach itself or the ulcer and not do a gastroenterostomy.

DR. ROLAND E. SKEEL of Cleveland said the diagnosis of perforative gastric ulcer was not always easy; that patients who had such an ulcer usually had repeated attacks of localized peritonitis. They complained of intense abdominal pain beforehand, and physicians were led to make a diagnosis of gastric ulcer because of the previous attacks of pain, and the diagnosis was not made in the last two or three hours. He recalled the case of a man who died promptly because it was insisted that he was having dyspeptic pain. The diagnosis was not easy until after primary shock had passed off. Internists were making a diagnosis of gastric ulcer at the present time and treating the cases medically. He narrated a case to show how a little accident may reflect upon a practitioner. A patient had some trouble in the stomach, was sent to a hospital the night before for observation, was given a test meal, and had perforation toward morning. A stomach-tube was inserted in the morning. Symptoms of acute perforation did not come on markedly until eight or nine o'clock, when the man went into collapse. His abdomen was opened and a perforation found. Naturally the practitioner was criticized for passing a stomach-tube. All recognized authorities had for years counselled against the passage of a stomach-tube in cases of gastric ulcer.

DR. JOSEPH PRICE of Philadelphia contributed a paper entitled

IMPORTANCE OF PUBLIC AND PRIVATE HOSPITALS IN THE EDUCATION OF YOUNG PHYSICIANS AND NURSES, AND THE CLINICAL INSTRUCTION OF PRACTITIONERS.¹

DR. WILLIAM J. GILLETTE of Toledo, Ohio, read a paper entitled

TORSION OF THE GREAT OMENTUM.¹

DR. ROBERT T. MORRIS of New York contributed a paper entitled

PELVIC REFLEXES.¹

DISCUSSION.

DR. RALEIGH R. HUGGINS, of Pittsburg, stated that since Dr. Morris had called attention to these reflexes several years ago, in all his examinations he had tried to elicit these signs and symptoms. Great difficulty was experienced in determining their value by first eliminating the condition Dr. Morris had dwelt most upon, and that was the neurotic or neurasthenic patient. It was very hard in the presence of pathology to tell how much value would be derived from operation. It was just as hard to determine in these cases when there was a tender spot at the right or left of the umbilicus whether it was due to some pathological condition in the appendix or in the pelvis, or whether these organs were perfectly normal. There was no question about the necessity for removing irritating lesions. Oftentimes the neurasthenic was benefited by an operation. There were no doubt border-line cases of insanity occasionally cured through operative measures.

DR. EDWARD J. ILL, of Newark, New Jersey, read a paper entitled

SECONDARY REPAIR OF COMPLETE PERINEAL LACERATIONS;
THE TECHNIC AND RESULTS.¹

DR. J. H. CARSTENS of Detroit read a paper entitled (a)

CESAREAN SECTION, THE PREGNANT UTERUS BEING WITHIN AN
UMBILICAL HERNIA.¹

¹ To appear later in this Journal.

DR. WILLIAM H. HUMISTON of Cleveland Ohio read a paper entitled (b)

HIGH OPERATION IN CESAREAN SECTION, ILLUSTRATED BY A CASE REPORT.¹

DR. ASA B. DAVIS of New York read a paper entitled (c)

CESAREAN SECTION BY THE SMALL MEDIAN INCISION ABOVE THE UMBILICUS.¹

DISCUSSION.

DR. E. GUSTAV ZINKE of Cincinnati said that Dr. Davis coincided with the opinions he had entertained with reference to Cesarean section. He had voiced his sentiment thoroughly when he said that the operation had obtained a wide range of application, and the range of application would probably increase as time advanced, but the operation would not be performed in the future for one cause for which it had been employed, and that was in cases of puerperal eclampsia, unless it be wholly and entirely in the interest of the child. He had been one of those who had taken advanced ground with reference to the utility of Cesarean section, having performed it ten times, his first and last cases being fatal. The first one died of sepsis, being infected at the time of the operation, and the operation performed solely in the interest of the child. The last case he lost from post-partum hemorrhage.

DR. HENRY SCHWARZ, of St. Louis, Missouri, said that the only exception he wanted to take to the paper of Dr. Humiston was his statement making placenta previa a basis for Cesarean section. He would ask him how he knew he had a case of central placenta previa before he had complete dilatation of the os. One could not tell what kind of placenta previa there was until the os is dilated—at least he could not. Nor was it necessary in case of placenta previa at any time to do Cesarean section.

DR. WILLIAM G. DICE, of Toledo, Ohio, said the members of the association should impress upon general practitioners the importance of diagnosing contracted pelves before patients went into labor, and to bring them to the surgeon at an early date.

DR. J. GARLAND SHERRILL, of Louisville, had had four cases of Cesarean section, with a maternal mortality of *nil*, and a fetal mortality of 25 per cent.

DR. F. W. SEARS, of Syracuse, reported a case to which he had been called, the woman having been in labor twenty-four

¹ To appear later in this Journal.

hours. It was impossible to dilate the cervix, consequently she was brought to the hospital, a Cesarean operation done, and her recovery was uneventful.

DR. MAURICE I. ROSENTHAL, of Fort Wayne, said there was a danger following Cesarean section which should be recognized, namely, that of rupture of the uterus in subsequent pregnancy. This was not only true of Cesarean section, but of operations on the pregnant uterus.

DR. HERMAN E. HAYD, of Buffalo, New York, read a paper entitled

INTUSSUSCEPTION IN INFANTS.¹

DR. LEWIS C. MORRIS, of Birmingham, read a paper entitled

CONSERVATISM IN OPERATIONS ON THE UTERINE APPENDAGES.¹

DISCUSSION.

DR. ARTHUR T. JONES, of Providence, Rhode Island, had done considerable plastic work on tubes and ovaries, and was less enthusiastic at the present time regarding it than he was five years ago. He believed that a tube which was once infected was the same as an appendix that had once been infected—namely, a source of danger to the woman, and while we would get occasionally a success after repairing the tube, a great many cases would come to secondary operation. He did not believe it was a good plan to remove the products of ectopic gestation from the tube, sew up the tube and leave it. The tube should be removed.

DR. K. ISADOR SANES, of Pittsburg, said the question of conservatism would seem to depend upon the degree of anxiety of the patient to preserve her organs as well as menstruation. If a patient was anxious to have children she should be given the chance and the benefit of a conservative operation, and nine times out of ten she would take that chance.

DR. HUGO O. PANTZER, of Indianapolis, detailed a case showing that conservatism could be carried too far.

DR. ELLIS W. HEDGES, of Plainfield, New Jersey, said there was one consideration that ought to be taken into account in dealing with pus tubes, and that is the condition of life of the woman. If the woman was a wage earner, who had to make her living and to support herself or family, we should deal with

¹ To appear later in this Journal.

such a case in a different manner from what we would a woman who belonged to the richer class.

DR. H. S. LOTT, of Winston, North Carolina, said that women wanted a normal conception within the uterus, if possible. If the distal end of the tube was amputated with its fimbria and the ovary left, the function on that side was abolished. But supposing the tube remained patulous for even a short time, the ovarian product could not find its way in, the function of the fimbria was abolished on that side, but the spermatozoa might find their way out and into the cavity and perchance, if they met the ovarian product, conception might occur, which might be very dangerous.

DR. C. C. FREDERICK, of Buffalo, said he may have misunderstood Dr. Lott, but if he did not, he did not think his remarks should appear in the transactions as the consensus of opinion of members of the society. It was a well-known fact that resected tubes did functionate. It was well known that many women had borne children whose tubes had been resected to all degrees from the fimbria down to a little stump of the tube that was not over the thirty-second of an inch long. There were many cases on record of pregnancy having occurred where the tube had been cut off at the cornu and tied, and while it was not expected that these women would become pregnant, they did.

DR. ROLAND E. SKEEL, of Cleveland, called attention to the difference in etiology of pus tubes and inflammatory conditions of the ovaries.

DR. RALEIGH R. HUGGINS, of Pittsburg, read a paper entitled

INTRAVENOUS INJECTION OF MAGNESIA SULPHATE IN BACTERIEMIA.¹

DISCUSSION.

DR. HENRY SCHWARZ, of St. Louis, said there was no possibility of bacterial vaccines ever doing any good in cases of acute infection.

DR. RALPH WALDO LOBENSTINE, of New York, read a paper entitled

FIBROMATA OF THE UTERUS COMPLICATING PREGNANCY, LABOR, AND THE PUERPERIUM.¹

DISCUSSION.

DR. E. GUSTAV ZINKE, of Cincinnati, stated that his experience had been limited to four cases. The first one was a case of inter-

¹ To appear later in this Journal.

stitial fibroid involving the entire uterine musculature. Post-mortem examination revealed the uterine wall to be 2 inches throughout, the cervix included. The condition was not recognized, and the family physician, when the woman went into labor, was surprised to notice there was no progress being made. He sent for a consultant, and the two waited and waited, and there was no progress at delivery. The membranes ruptured, but there was no evidence of this woman delivering herself spontaneously. When the speaker was called the unfortunate woman was *in extremis*, septic from repeated examinations, and efforts at introducing the hand into the uterine cavity, none of which succeeded. The woman had a temperature of 103° , pulse 140, and scarcely to be felt. She had also had considerable hemorrhage, and it was evident that she was doomed. Examination revealed the fact that there was no evidence of any fetal movements. The case was desperate. He resorted to abdominal section, and when he incised the uterus he found it the thickness he had described, firm and hard.

He detailed the other three cases that had come under his observation.

DR. FRANCIS REDER, of St. Louis, called attention to the point that a uterine tumor, without showing any evidence of growth for a long time, would become stimulated into growth by pregnancy taking place.

DR. L. F. SMEAD, of Toledo, recalled a case of pregnancy complicated with submucous myoma. The woman went on and died from septicemia. He thought an early hysterectomy would have saved her life.

DR. K. ISADOR SANES, of Pittsburg, reported three cases in which it was necessary to do hysterectomy during pregnancy, and he was compelled to operate in the third and fourth months on account of pressure produced by the tumors.

DR. AARON B. MILLER, of Syracuse, related cases of tumors complicating pregnancy, etc., on which it was necessary to operate.

DR. THOMAS B. NOBLE, of Indianapolis, said that when these tumors were situated posteriorly below or behind the cervix they demanded very careful study, and reported a case in which it was necessary to do a Cesarean section.

DR. CHARLES N. SMITH, of Toledo, reported six cases of pregnancy complicated by fibromata.

DR. LEWIS C. MORRIS, of Birmingham, reported two cases. In one the woman was four months pregnant, with a pedunculated fibroid tumor, in which a twisted pedicle occurred associated with violent pain. The woman came to operation. The tumor was the size of the pedicle. The other was a case of fibroid tumor on the left side of the lower uterine segment. The woman had gone to term, and had been in labor forty-eight hours when seen. She was completely exhausted and labor pains had practically stopped. The pelvic outlet was blocked

by the fibroid. Cesarean section was done, but patient died on the fourteenth day after operation from puerperal septicemia.

DR. LOBENSTINE, in closing the discussion, said that his object in writing the paper was to bring out certain points, and one of them was that myomectomy or any other procedure during pregnancy was not necessary; that there were cases, especially of the pedunculated variety of tumors, in some cases of sessile, with a great deal of pain and a great deal of enlargement that might require operation, but as a rule the cases would go through pregnancy without requiring myomectomy. Secondly, the vast majority of patients would proceed normally through labor.

DR. N. STONE SCOTT, of Cleveland, Ohio, read a paper entitled

TWO RIGHT-SIDED FEMORAL HERNIAS COEXISTING IN THE SAME PATIENT.¹

DR. E. GUSTAV ZINKE, of Cincinnati, read a paper entitled

COMPARATIVE MERITS OF MEDICAL AND SURGICAL TREATMENT IN THE REDUCTION OF MATERNAL AND FETAL MORTALITY IN PUERPERAL ECLAMPSIA.¹

DISCUSSION.

DR. HENRY SCHWARZ, of St. Louis, said they had been able both in the clinic and in private practice to reduce the occurrence of eclampsia materially by insisting on placing the pregnant woman under observation. Even in his out-clinic practice women were forced to report, or they were looked up, and their urine was examined, and they received general rules as to how to conduct themselves during pregnancy. Especially was it necessary to give out-clinic patients general rules as to cleanliness of the skin and keeping the bowels open, and subsisting on a diet of plenty of fruit, plenty of vegetables, and an abundance of pure water. He was sure that by so doing they had greatly reduced the number of cases in which albuminuria showed itself.

DR. K. ISADOR SANES, of Pittsburg, said the statistics presented by the essayist demonstrated that convulsions after labor were not as injurious as convulsions in a woman before labor. Vaginal Cesarean section was not the treatment if the child was born, nor was it the treatment during active labor with the parts dilated, because he thought Dr. Zinke would agree that if the cervix was dilated sufficiently for the child's head to present there would be no harm done in applying forceps in labor. The

¹ To appear later in this Journal.

only question of difference was in women prior to labor or just at the beginning of labor where the convulsions followed one another. If a woman was unconscious, all one had to do was to put her on the table and do a vaginal Cesarean section, which could be done in three to five minutes. This short time did not mean the closure of the incision, but simply the delivery of the child.

DR. H. WELLINGTON YATES, of Detroit, said that in his experience he had found in many instances that there was very little albumin in the urine; there was not more than would be found in many ordinary cases of confinement; that these women went on until the time of delivery, and suddenly developed eclampsia. In these cases he thought there was either a faulty metabolism or increased metabolic changes on part of the infant or perhaps toxins from the placenta which caused the convulsions. There were cases in which the convulsions came on one after another in the last stages of pregnancy, and in these the uterus should be emptied promptly, and the Association should go on record as favoring vaginal Cesarean section in every case of this particular type.

OFFICERS.

The following named officers were elected for the ensuing year: *President*, DR. HERMAN E. HAYD, Buffalo, New York; *Vice-Presidents*, DR. HENRY SCHWARZ, St. Louis, Missouri, and DR. LEWIS C. MORRIS, Birmingham, Alabama; *Secretary*, DR. WILLIAM WARREN POTTER (re-elected), Buffalo, New York; *Treasurer*, DR. X. O. WERDER, Pittsburg, Pa.; *Councilors*, DR. AARON B. MILLER, Syracuse, New York, and DR. JOHN W. KEEFE, Providence, Rhode Island.

The next meeting will be held at Louisville, Kentucky, September 26, 27, and 28, 1911.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

SCARLATINA.*

BY

J. FINLEY BELL, M. D.,
Englewood, N. J.

History.—Scarlatina is an acute specific and infectious disease existing in certain countries endemically and characterized by sporadic and epidemic outbreaks. Dr. Alfred Hand, of Philadelphia, November 9, 1909, in reviewing the history of scarlet fever finds the first authentic reference in the report of Henry Smeitius of Heidelberg, in 1600, of a case he had observed in 1581. According to Sydenham scarlatina was differentiated from measles in the seventeenth century.

Etiology.—The etiology of scarlatina is its bacteriology and, as the specific infective organism has yet to be discovered or isolated, the etiology of the disease is at present unknown.

From time to time various observers have reported specific germs, but none have withstood the final test. It is most surprising that a contagious disease known as such for three countries, that has caused numberless ruinous epidemics as regards mortality, and continued morbidity in child life, should have so long escaped a thoroughly systematized investigation.

In 1885 there occurred in North London and Hendon, England, a milk-borne epidemic of scarlet fever. Dr. Kline isolated a streptococcus from the throats of the patients and the pustules on the udders of some of the cows contributing to the milk supply, which were morphologically and culturally identical. Kirth in 1891 found the streptococci isolated from the scarlatinal throat different in cultural peculiarities from the streptococcus pyogenes in that this form coagulated milk and conglomerated

*Read before the Association of American Teachers of Diseases of Children, June 6, 1910.

in broth culture. The name *streptococcus conglomeratus* was given this supposedly special strain. Baginsky, Gordon, and several Russian observers all favor the streptococcic origin of the disease.

Class of Chicago isolated a very large diplococcus from 300 consecutive cases of scarlet fever on a special medium of glycerin, agar, and garden earth. He succeeded in producing in swine a disease closely resembling scarlatina.

Mallory has described a protozoon which he discovered in the scales and later DuVoll found it in the blood serum. He named these bodies "Cyclastar Scarlatinalis." Other observers have either failed to find these bodies or regard them with little importance as etiological factors. While the evidence is preponderatingly in favor of a causative virus antecedent to the streptococcus, evidence is not lacking that the streptococcus is closely associated with most of the grave developments of the septic type of the disease. What this antecedent virus is it is the duty of the research laboratories to investigate and determine. A research plant, correct and ample in its appointments, will obviously be necessary for the successful prosecution of such investigation with safety to the investigator and the public.

An investigation similar to that of Flexner and Lewis of the Rockefeller Institute in poliomyelitis, I am sure would be fruitful in results and an enduring credit to the department of experimental medicine.

It is highly probable that the infective organism of scarlatina like that of poliomyelitis belongs to the class of filterable viruses and too minute for observation by means of the modern microscope. It is further possible that this virus may not act directly but indirectly by fertilizing the field or in some way modifying the virulence of the streptococcus. During an epidemic of scarlatina in 1904 the writer isolated a streptococcus from the throats of four cases of scarlet fever occurring in one family. These cultures were plated out in agar and a streptococcus isolated which was planted in milk and broth. In the first instance the streptococcus was identical in its cultural reactions to that of Kirth; of the remaining three cultures Nos. 2 and 3 clotted milk very slowly and incompletely, but did not conglomerate in broth. No. 4 conglomerated in broth, but did not clot milk, while that in which No. 2 and 3 grew was 1.5 per cent. acid. Regrowing Nos. 2 and 3 in acid broth gave a moderate conglomeration.

In 1895, while engaged in an investigation into an epidemic of cowpox which occurred at East Hampton, L. I., I found cultures from the pustules on the thighs and udders of the infected animals invariably contained streptococci which coagulated milk. Conglomeration in broth was not observed. Klein was evidently dealing with an epidemic of cowpox among the cows and a coincident epidemic of scarlatina among the children.

ETIOLOGICAL FACTORS—PREDISPOSING CAUSES.

Age.—In contradistinction to pertussis and measles the very young rarely contract scarlatina. In the first half of the first year very few cases are reported. In the last half it occurs with increasing frequency. During these early months the mortality is high. After the first year the incidence gradually increases until the fifth year when there is a material increase during the sixth. After the sixth year and until the tenth there is a slightly lower prevalence. It is noteworthy that the year of highest incidence corresponds to the beginning of school life. There can be no question that children afflicted with diseased and hypertrophied tonsils and postnasal adenoids possess a relatively marked susceptibility to scarlatina, and in such cases it is liable to assume the toxic or septic type of the disease. Most authors ascribe to the fall and winter seasons the greatest prevalence. In my experience the most extensive epidemics and severe types of the disease have occurred during the late winter and early spring months.

Sources of Infection.—Direct contact of course furnished the highest infectivity. Even so, not more than 30 per cent. of exposed nonimmune persons contract the disease. The writer is not in sympathy with those authors who lay great stress upon the infectiousness of the dried desquamating scales at remote periods. No one has yet submitted experimental evidence in substantiation that the dried scales retain for long, in the living and infectious state, the virus of scarlatina. Clinical observation in substantiation of the theory does not rest on a sound basis and the reports of epidemics originating in this way cannot be regarded as conclusive—many are conjectural. It is highly probable that the perspiration contains the living virus and dried inert scales coming in contact with the perspiration may be thus rendered infective for a time. It is very certain that the throat and nasal secretions contain the active virus and probably

also the tears, urine, or feces. Pus from suppurating foci may also harbor the virus. While cats and dogs can carry the infection on their fur, and persons on their clothing, infection is probably not spread commonly in this way. It is much more probable that immune persons and animals can inhale the living organisms from the air recently befouled by coughing or sneezing of a scarlatina patient and harbor them in their air passages when they are furnished with the needful elements for their viability to be in turn coughed or sneezed out befouling the atmosphere in the presence of nonimmune persons to be in turn inhaled by them.

Possibly some of the domestic animals are susceptible to scarlatina and become unrecognized sources of infection. Scarlatina is probably most infectious in the first stages.

During the past twenty-five years I have made observations in eight epidemics of scarlatina comprising about 114 cases. The results have shown that, other things being equal, if scarlatina is contracted from a case by direct exposure in the first stages of the disease, even though such case is of the mild type, the resulting case is almost certain to be severe. On the other hand, if the direct exposure is in the later stages, even though such case be severe, the resulting case will probably be mild. In my experience this will hold true in about 90 per cent. of cases, allowances being made for the personal equation.

The last epidemic observed is no notably true in this regard as to warrant a brief description. In 1905 I was called to see a nurse maid in one of my families who three days before had returned from a visit to her former employer in Brooklyn where there had been a case of eruptive disease several weeks before, the nature of which the various physicians summoned had not agreed upon, but it was finally concluded the rash was of digestive origin. She had a temperature of 100 with a red throat and no eruption. Two days after I saw the nurse-maid the waitress, twenty-two years old, who occupied the room with her at night came down with a severe attack of scarlatina. The nurse-maid then confided to me that the afternoon before I saw her her face and neck were flushed for a short time. Both were quarantined on the third floor in charge of a nurse twenty-four years old who had scarlatina when she was ten years old along with her two sisters, an epidemic of scarlet fever then prevailing in her home village. Two days after taking charge of these patients in quarantine she became ill with her second attack of

scarlet fever of a toxic type, the eruption was of a purplish hue, and swelling of the throat and neck extreme, nervous symptoms profound. Temperature 104 to 106°, pulse 150 to 180, and in three days she died. There were four children in the house and they in the meantime had been sent to New York. The nursery maid and waitress were kept in quarantine nine weeks, the waitress desquamating twice profusely. The nursery maid did not desquamate visibly. Ten days after the subsidence of the second desquamation she visited Jersey City where there were no children with instructions to remain there three weeks before taking another position, as she still had a discharge from the left nostril. In the meantime she was sent for to take charge of the children in New York, and on the fourth day after so doing the eldest boy, eight years, became slightly ill. There was slight evanescent rash of indefinite character with slight temperature. He was seen by a skilled pediatrician in New York, in whom I have every confidence and regard. A history of unrestrained indulgence in strawberries was obtained which could account for the eruption. Less than two days after the appearance of the rash on this boy his little sister five years old came down with a septic form of the disease and died within a week. After the sister was taken sick the boy was returned to Englewood where, after a few days, I found him desquamating.

Here we have every reason to believe that the nursery maid contracted the disease in an exceedingly mild form from a mild case in the late stage. From her mild case in the first stage the waitress contracted the disease in a severe form and from the waitress in the first stage of the severe form the trained nurse contracted a toxic type with rapidly fatal termination. Then the brother contracted a mild form from the waitress's severe form in the last stages and the little girl contracted a septic form of the disease from her brother in the first stages of his mild attack. The value of this observation will be referred to under prophylaxis. If this observation continues to hold good and is confirmed by others it should modify the conduct of the mild and uncertain cases of scarlatina.

Portal of Entry.—Evidence points conclusively to the upper air passages as the portal of entry.

Period of Incubation.—In my experience the period of incubation has never exceeded five days. In three severe cases it was less than twenty-four hours. In seven mild cases three days.

Period of Infection.—It is impossible to state how long a case

of scarlet fever will continue to be infectious. In my opinion desquamation is valuable in consuming sufficient time for the subsidence of discharges and secretions which really harbor the virus. Various authors refer to the early virulence during the febrile stage, then to its diminution, and a returning virulence during the stage of desquamation. It should be noted that this later stage also corresponds to the period of certain complications accompanied by infective secretions and purulent discharges. Septic types of scarlatina and those patients with diseased tonsils and adenoids, particularly if the accessory nasal sinuses have been involved, should be treated as sources of infection as long as evidence of catarrh continues without regard to the time when desquamation ceased.

Pathology.—The pathological changes in scarlatina are principally involved in the complications and sequellæ. In the first stage of the disease the skin and mucous membranes are intensely congested. There is more or less glandular enlargement, especially in the throat and neck. The kidneys are frequently enlarged with slightly adherent capsules. The Malpighian bodies are enlarged and there is apt to be inflammatory exudation in the glomeruli.

Blood Changes.—There is usually a high leukocyte count—15,000 in the mild and uncomplicated cases to 40,000 in the septic cases. In the case of the trained nurse referred to above, leukocytosis was 12,000, polynuclear count 93 per cent. Eosinophilia has been generally noted after the third or fourth day. In cases where blood observations have been made daily the eosinophilia may be of diagnostic importance in doubtful cases.

Urine.—In the early stages the urine is scant, specific gravity high, and urea increased. In the later stages the quantity becomes normal and urea diminishes. In some forms acetone is frequently present, less frequently diacetic acid. The diazo reaction has not been frequently positive in my hands; contrary to the findings of Lauder and Thompson it has been present in mild cases and frequently absent in the severe types. Indol-acetic acid has been present in my last three cases during the early stages.

Clinical Types.—Scarlatina presents a wide degree of severity. By its mildness it may be difficult or impossible of diagnosis. Again it will fall upon our little patients with all the fury of a beast of prey, terminating fatally within a few hours.

Ordinary Type.—The stage of invasion is always brief, usually

not more than twenty-four hours from the advent of the first indication of illness to the height of fever and beginning eruption. There is usually a brief period of indisposition, fever, sore throat, headache, and vomiting. The skin is hot and dry. Temperature 102° , a pulse of 140 or 150 is not uncommon. Young children may have convulsions. There is marked redness of the cheeks before the rash appears which is rarely if ever punctated. There is an area around the mouth of more or less intense pallor. The degree of pallor bears some relation to the intensity of the attack. The tongue is heavily coated. There is redness and swelling of the tonsils and they are frequently covered by exudate. Desquamation begins soon after the subsidence of the rash in the location where it first faded in the form of fine branny scales, later giving way to ribbons and patches.

Mild Type.—The symptoms may be so mild as to escape ordinary vigilance, usually, however, there is a sharp rise in temperature to 100 or 102° , a markedly rapid pulse, moderately sore throat and headache, nausea, and vomiting. The eruption may be so limited and fleeting as to escape detection and, lastly, desquamation may be nil or slight. The tongue is coated and the papillæ enlarged. The mild type is frequently regarded by the laity as scarlatina in contradistinction to scarlet fever and that its infectivity is slight or nil. These children are frequently sent to school during the existence of the disease and doubtless give rise to many epidemics of mysterious origin.

Severe type is marked by exaggeration of all the above symptoms. It is occasionally ushered in by a chill in older children and by convulsion in the young. There is marked glandular enlargement in the neck and the axillary and inguinal groups may also be involved. The pulse and temperature rapidly ascend and delirium may ensue early. There is always restlessness. The nausea and vomiting may continue and seriously interfere with feeding. This type furnishes most of the septic forms and complications.

Toxic or Malignant Type.—In this type the patient suffers from an overwhelming toxemia which frequently kills within twenty-four hours. Most cases succumb soon after the eruption appears, but death has taken place before and within a very few hours after the onset. The nervous symptoms are intense and the temperature high, 107° or more, pulse 200 or more. Occasionally in exceptionally severe cases the temperature may be low, even subnormal. Such cases are the most rapidly fatal.

During the season of 1893 I was called at midnight to a little patient thirteen months old. It had arrived in the village where I resided two hours before. Temperature 106.5° , pulse 160. She was stupid, difficult to arouse, unable to take food, skin hot and dry, swelling at angles of jaw, tonsils red, swollen, and covered with yellowish exudate. They had left a summer hotel in another resort 157 miles away because they felt insecure about a disease which was prevailing among the children, the nature of which they could not learn. In the seven hours required for the journey this baby, apparently well when leaving, became ill. I learned later that there were eight or ten cases; all were mild and recovered except the last two cases which were then in their tenth day and doing well, and to one of which this baby had been exposed. The temperature rose to 107° , pulse could not be counted. It died at 8 A. M. the following day, having been ill twenty-five hours. A typical rash appeared at the time of death.

Surgical Type.—When scarlatina occurs in a surgical case it is apt to pursue an irregular course. At least one case is on record of surgical infection through a wound.

Puerperal Type.—I have had two cases of scarlatina occurring in puerperal cases. The surroundings in both cases were most unsanitary and unhygienic, yet both recovered. One case was mild, the other was severe with a complicating otitis media.

SYMPTOMS.

Invasion.—Scarlatina is a disease characterized by abrupt invasion. There is a sharp rise in temperature, marked acceleration of the pulse in all cases even though the temperature rise be little. In the mild type vomiting has not been an unfailing symptom in my cases. Sore throat has been frequently so slight as to cause no subjective symptoms in the young. Some observers have noticed a gradual onset in the milder types. It has not been so in my cases. In the toxic type there is stupor, delirium, or convulsions with all the evidences of a rapidly accumulating toxemia.

Temperature.—While the temperature of scarlatina is not characteristic it is apt to rise suddenly during the first day then drop to rise again as high or higher the next day. If the course is uncomplicated a rather sharp decline is apt to take place. The height of fever during the first and second day indicates

with fair certainty the severity of the attack. Rises of temperature late in the course of the disease always indicates a complication or a possible relapse.

Pulse.—The pulse-temperature ratio in scarlatina is typical. The pulse is always high in proportion to the temperature and is probably caused by selective action of the scarlatinal toxin. A pulse of 120 in mild to 180 in severe cases is not unusual.

Throat.—Soreness of throat is always present and varies with the severity of the attack from a slight redness to intense swelling with extensive exudation. The exudate seen in the early stages is probably due to cocci, but a membranous exudate in the later stages would suggest a complicating diphtheria. The inflammation in the throat may extend upward through the postnasal cavity and involve the accessory sinuses.

Glands.—There is always severe glandular enlargement about the angle of the jaw and in the neck. In the severe cases the axillary, epitrochlear, and inguinal glands may be involved. The neck glands may become much swollen, painful, and finally suppurate.

Eruption.—The scarlatinal eruption appears first upon the sides of the neck, gradually spreading over the entire body. The redness of the face, notably the cheeks, is rarely punctated as is the rash in other parts of the body. There is always a ring of more or less pallor around the mouth depending on the severity of the disease.

The intensity and distribution of the rash varies with the severity of the attack as a rule, although in the toxic types the rash may not appear at all or be deferred until about the time of death. Usually the rash is well established on the second or third day of the illness.

Desquamation.—In doubtful cases this stage of the disease is awaited with interest. It frequently determines whether an apparently well child shall be continued a prisoner for an additional several weeks. It is the one absolutely typical development of scarlatina and begins as a rule first upon the hands, later the feet, then the arms and legs, and lastly the trunk. It is branny at first, later it may be shed in ribbons or flakes. A second and third desquamation may occur—occasionally after slight rashes visible desquamation does not occur.

Tongue.—Much importance has always been attached to the character of the tongue in scarlatina. During the early stages there accumulates a thick white coating which after a day or two

breaks away in spots, the spots corresponding to the apex of the enlarged papilla which seems to protrude through the coating, causing the tongue to resemble an "unripe strawberry." These spots gradually grow large and coalesce, leaving a red surface upon which are superimposed the enlarged papillæ and giving the tongue the appearance of a "ripe strawberry." These changes in the tongue require from three to five days, and if they have developed in regular order possess considerable diagnostic value.

Complications and Sequelæ.—The common complications of scarlatina are angina, otitis, adenitis, arthritis, and nephritis (to these may be added sinusitis, ethmoiditis, and mastoiditis).

Angina.—The intensity and character of the throat complications of scarlatina present a wide variation. In the mild cases slight redness and moderate swelling. In severe types of the disease, usually about the third day more or less exudation of false membrane of streptococcic origin forms on the tonsils which may spread to the neighboring structures, frequently invading the nasopharynx and accessory sinuses. Owing to the swelling and resulting obstruction to respiration, mouth breathing becomes necessary and adds to the discomfort and restlessness of the patient. Sinusitis frontalis and ethmoiditis are not infrequent complications in connection with the angina not generally recognized. In the very severe type there may be also extensive gangrenous ulceration which constitutes by far the most serious phase of throat complication. The swelling and soreness is extreme and the odor offensive. The constitutional symptoms of severe infection are always present and the prognosis extremely grave.

Otitis.—Otitis is probably the most frequent and serious complication of scarlatina. When it occurs during the first stages its advent may be most insidious and frequently unaccompanied by pain or at least the pain cannot be differentiated from the general head discomfort. It occurs with the greatest frequency in the young, and children with diseased tonsils and adenoids are especially prone. Even with prompt treatment permanent deafness may follow. The ears should be examined daily as part of the routine examination in this disease. Otitis develops most frequently during the second and third weeks after the febrile stage and its advent is always marked by a sharp rise in temperature, and while prompt recognition and treatment of otitis renders more remote the occurrence of mastoiditis it

cannot always be avoided. I have seen mastoiditis develop in scarlatinal otitis when the drum was incised at the first indication of bulging.

Adenitis and Peradenitis.—Adenitis and peradenitis are frequent complications of the septic stage of the disease. Not only are the lymph nodes invaded by the streptococcus, but the perilymphatic tissues as well. The stiffness of the neck and position of the head remind one of meningitis. If the deeper glands are enlarged or the cellular tissue much involved there is apt to be dyspnea.

Encroachment upon or involvement of the jugular vein or carotid artery and septic infection are common developments and render the prognosis unfavorable. If the mediastinal glands become involved dyspnea is much increased.

Arthritis.—Synovitis is by far the most frequent joint complication of scarlatina. A small joint of the finger is the seat of predilection for the simple form which may be mild, moderate, or severe. It is usually acute, lasting three or four days when complete recovery takes place. It occurs in patients of four years or more, and about the second week of the disease. Septic synovitis is less frequent and usually involves the large joints. It belongs to the septic type of the disease and is a serious complication with unfavorable prognosis.

Nephritis.—During the early stages of the disease there may be slight albuminuria which disappears with the subsidence of the fever. In the very severe septic types of scarlatina a septic nephritis may develop. Scarlatinal nephritis presents a typical picture of diffuse nephritis and occurs during the stage of desquamation. Between an exceedingly mild and a very severe form all grades of severity are found. There is usually slight fever, restlessness, headache, and edema accompanied by marked reduction of urinary secretion. If the urine has been examined regularly every day or two, albumin in small quantities will be found preceding the active symptoms several days. When the nephritis becomes active there will be casts, blood, and renal epithelium. The prognosis in nephritis even when severe is not necessarily unfavorable if treatment is begun early. Hence the importance of daily urine examinations.

OTHER COMPLICATIONS.

Lungs.—Pneumonia, pleuropneumonia, bronchopneumonia, empyema are all serious complications frequently occurring

in connection with the severe or septic type and have a high mortality.

Heart.—Peticarditis and endocarditis occur infrequently. They are usually associated with other complications. Permanent lesions occur with relative infrequency. Endocarditis may assume the malignant type. The myocardium is frequently involved in septic types of scarlatina.

Nervous Symptoms.—Initial convulsions in scarlatina occasionally occur. In the later stages convulsions may occur with neglected or severe nephritis; in the ordinary type there is marked restlessness; in the severe type delirium; in the toxic type stupor with or without convulsions.

Meningitis.—Meningitis occurs most frequently in connection with otitis and mastoiditis; chorea and paralysis are rare.

Digestive System.—Vomiting in all but the mildest types commonly occurs in the early stages of scarlatina and usually in the toxic type throughout. There is loss of appetite and diarrhea may be present.

Appendicitis.—Appendicitis has occurred in two of my cases. Both were operated and recovered without further complication.

Typhoid Fever.—Typhoid fever has occurred in three of my cases during the stage of desquamation. The typhoid infection was mild and its course was not modified by the preexisting scarlatina.

Diphtheria.—While membranous exudate in the throats of scarlatinal patients occurring in the early stage is of coccic origin, in the later stages it is invariably due to true diphtheria, in which the Klebs-Loeffler bacilli can be demonstrated, frequently by smear, but more reliably by culture.

Diagnosis.—Typical and moderately severe forms of scarlatina are not difficult of diagnosis. Irregularities in the development and character of the eruption, extreme mildness of the attack, or absence of one or more of the usual symptoms may render the diagnosis difficult or impossible until desquamation should or does ensue.

Rubella.—Rubella may be mistaken for mild or irregular scarlatina. Rubella has practically no stage of invasion; vomiting, fever, sore throat and rapid pulse are wanting.

Influenza occasionally is accompanied by a rash, notably so if salicylate of sodium has been employed in its treatment.

Measles.—The prolonged stage of invasion with coryza, red eyes, photophobia, and the character of eruption will suffice to differentiate scarlatina from measles.

Prophylaxis may be considered under three heads: 1. Isolation of the patient. 2. Segregation of nonimmune exposed children. 3. Care of the patient in isolation. When a child exhibits fever, rapid pulse, sore throat, and vomiting there can be no question about the advisability of isolation, the more important if these are other children in the house who have not had the disease. It is best not to wait for the eruption. In case the eruption is tardy or indefinite or the tongue has not been characteristic isolation should continue until the period for desquamation has passed. Should desquamation fail to appear after some or most of these symptoms have occurred, and the quarantine is relaxed, we shall probably turn loose some cases of scarlatina. However, they will be in the later stages of the disease and, if my observations are generally correct, such patient will be likely to transmit a mild type of the disease.

Segregation of susceptible exposed children is exceedingly important. If possible they should be in the hands of a trained nurse and the slightest departure from health should be reported to the physician. In case the child falls sick in school it is best to close the school for a week and the children so exposed visited daily. The detention should continue for at least a week. Should one among them contract the disease it is best that those in the same department should continue in detention a week longer.

Care of the patient as regards prophylaxis is most important. Attention should be directed to the throat, nose, and skin; if the child is old enough to gargle or douche the nose it should be required to do so. Alkaline antiseptic solutions can be used. If the throat is very sore and there is much ulceration, in the young careful swabbing must be resorted to. If there is much engorgement of the nasal mucous membrane, particularly if there is deformity or adenoids, shrinking the membrane once a day with adrenalin will relieve the patient and materially assist in drainage. Care of the skin embraces the measures for facilitating desquamation and at the same time controlling it. Antiseptic ointments are useful because they cause the scales to adhere and add to their weight. Really, it is the invisible desquamation which is most infectious, the scales being so small and light that they easily float about in the air. Oleaginous substances cause them to adhere and the bath which is equally necessary removes them for final disposal. It is best to begin this treatment early before the eruption fades. In this way the patient

himself is rendered less infectious from the beginning and if the period of detention is not shortened a patient so treated will certainly be much safer when liberated.

Medicinal Treatment.—The internal administration of drugs in scarlatina is limited to symptomatic indications arising in the course of the disease or of some of the complications and sequelæ, chiefly the later. Scarlatina is an acute febrile disease. The febrile stage is short and fever in itself will probably not be as harmful to the patient as the use of some drug for its depression. When the pulse is already weak and the blood-vessels of the skin markedly dilated aconite is contraindicated. A reduction of temperature secured by any of the coal-tar antipyretics is purchased at great expense. Hydrotherapy is one sheet anchor and should be the method of selection in all cases. The sponging should be started warm and gradually made colder, say to 90° F., rarely colder. Temperature will be reduced, restlessness and delirium quieted.

Serum Therapy.—Assuming streptococci to be the cause of scarlatina antistreptococcus serum has gained some ascendancy in its treatment. My experience with it is limited to two cases both of the toxic type. They were desperately sick. One died two hours after serum was given. In the other case the serum was given four hours after the initial symptoms, complete knowledge of the exposure being at hand. She grew rapidly worse after the serum was given and died nine hours afterward. I do not believe the course of this disease in either case was modified by the serum. I have had no experience with the vaccine treatment, but in the septic type autogenous vaccine should be promising.

PURPURA.*

BY

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SHALL we regard purpura as a distinct entity, as a disease appearing in various forms, or shall we regard this interesting manifestation as a mere symptom-complex occurring in the course of various diseases?

*Read before the American Association of Teachers of Diseases of Children, June 6, 1910.

The various purpuric affections have been distinguished as follows:

Purpura Simplex.—Hemorrhages merely on the external skin.

Purpura Rheumatica.—Skin hemorrhages with simultaneous involvement of the articulations.

Purpura Abdominalis or *Henoch's Disease*.—Skin hemorrhages with severe gastric and intestinal manifestations, also often articular involvement.

Purpura Fulminans, the gravest form of skin hemorrhages.

Purpura Hemorrhagica or *Morbus Maculosis Werhoffii*.—Skin hemorrhages combined with bleeding from mucous membranes or into the internal organs.

Attempts to sharply define each of these sets of cases has been made but the impossibility of doing so is shown by the fact that the different classes of purpura overlap, some cases frequently showing symptoms of two types. Then, again, the report of the following cases will show that purpura occurs under the most diverse conditions possible.

CASE I.—An infant, aged fourteen months, breast-fed exclusively and never having suffered from a previous illness was suddenly taken ill with severe eclamptic seizures. The convulsions had been preceded by extreme restlessness lasting several hours. There had been no vomiting. I saw this patient within half an hour after the first convulsion. The child was extremely fretful, appeared to have severe abdominal pain, and was constipated. Temperature 102° F., pulse 130, respiration 30 to 40 per minute. Heart and lungs normal. The following night he was extremely restless. The bowels had moved freely after a calomel and castor oil purge. He had suffered considerable pain and had one convulsion during the night. The temperature, pulse, and respirations remained about the same. On the following morning a general purpuric eruption appeared which was most intense on the inner side of the thighs and which gradually spread over the trunk and face. The lesions were about the size of a ten-cent piece. There were no hemorrhages from the mucous surfaces or bowels and no hematuria. The patient died twenty-two hours after the onset of the disease. The purpuric spots remained after death. No autopsy was permitted. This case is an extremely interesting one and can be placed in the category of purpura fulminans. Hemorrhages into the adrenals have been recorded in these cases.

CASE II.—Male, aged five months seventeen days. Admitted to the children's ward of the Allegheny General Hospital, May 21, 1909.

Family History.—Mother living and healthy. Father uses alcohol to excess and is also addicted to cocain.

Previous History.—At the time of its birth the infant was apparently healthy. It was breast fed until three weeks old

when it was given out to board and was then fed on various proprietary foods. According to the statements of the mother the patients bowel movements previous to admission to the hospital were of a greenish color containing mucus and sometimes considerable blood. He had lost rapidly in weight until at the present time he only weighs six pounds and two ounces.

Present Condition.—The patient is very much emaciated, presenting a marked cachectic appearance. Physical examination of the lungs, heart, liver, and spleen is entirely negative.

Urine.—The urine is yellow, cloudy in appearances, acid in reaction, and with a slight trace of albumin. No sugar, casts, or epithelium. A few leukocytes, many bacteria, but no blood are present.

Blood.—5,270,000 reds, 19,400 whites. Hemoglobin 75 per cent.

Differential count made three hours before death.

Polymorphonuclears,	0 per cent.
Small lymphocytes,	28 per cent.
Large lymphocytes,	8 per cent.
Transitional,	63 per cent.
Eosinophiles,	1 per cent.
Basophiles,	0 per cent.
Nucleated reds,	1 per cent.
Microcytes,	†
Macrocytes,	

On admission to the hospital he was placed on a diet of whey which he retained and digested.

On May 20 he began to vomit and has several loose bowel movements. He was then given barley water.

On May 21 small petechial spots appeared on the abdomen and soon spread to the chest and extremities. The purpura gradually increased and finally the patient's entire skin became a dark purple color so that he looked as if he were suffering from an extensive gangrene of the skin. He gradually became more and more exhausted until he finally died of asthenia.

The autopsy showed multiple hemorrhages into the stomach, ascending and descending and transverse colon. Uric acid and infarct of the left kidney. Pulmonary edema.

This case represents purpura occurring in conditions of high-grade malnutrition. I see it more or less frequently in hospital practice and always regard it as a fatal prognostic symptom.

CASE III.—This patient was seen in consultation with another physician. Female, aged twenty months, had been fed on condensed milk since birth. The child remained seemingly well and appeared to thrive until she had an attack of measles. This was followed by a lobar pneumonia which lasted about ten days. During her attack of pneumonia a peculiar eruption appeared on the skin which the attending physician regarded as a recurrence of measles. In addition there were also severe gastric and intestinal symptoms, vomiting and mucus and

considerable blood in the stools. The urine also contained a considerable quantity of blood. My examination was made during the fifth week of her illness. She was very anemic and had lost considerably in weight and was evidently suffering much pain, particularly when touched or moved. The feet were very much swollen. The entire body was covered by purpuric spots, likewise the face, even the tongue was involved, a condition which heretofore I had never seen. The gums were spongy and bled readily.

The history of condensed milk feeding, the appearance of the gums, the hyperesthesia, hematuria and anemia led me to make a diagnosis of scurvy.

The subsequent history of the case proved this diagnosis to be a correct one. The patient recovered very rapidly after the administration of orange juice, raw cow's milk, etc.

CASE IV.—Male, aged fourteen months. This patient was highly rachitic and suffered from pseudoleukemic anemia of infancy. The patient was anemic and the spleen was enormously enlarged with moderate enlargement of the liver and lymph nodes. The blood examination showed 2,287,000 reds, 16,000 whites, and 45 per cent. hemoglobin. Purpuric spots were seen over the entire body.

CASE V.—Male, aged four years. This patient was seen in consultation with another physician. The previous health of the child had been good. About four weeks previous to my examination the patient developed anemia. The superficial glands of the neck and axilla became enlarged. On examination the spleen and liver were also found to be enlarged. Purpura well marked over anterior surfaces of chest and legs. Blood oozing from nostrils and lips. Examination of the heart showed no cardiac enlargement. A rough systolic murmur could be heard at the base and slight systolic murmur at the aortic orifice. On auscultation moist râles could be heard over the anterior and axillary surfaces of the right lung with a few râles over the left lung.

The urine was normal and there was no blood in the stools. There were no symptoms of scurvy. Temperature 100.2° F., pulse 120. Suspecting pseudoleukemic anemia I suggested to the attending physician to remove the patient to the hospital for better examination and observation. Unfortunately, the patient's condition grew rapidly worse on the following day and his parents refused to bring him to the hospital. He died a few days later. No blood count and no autopsy were made. Thus many cases are lost to pediatric literature.

From the foregoing we may conclude that purpura occurs under the most varied conditions and diseases.

It is probably not a distinct entity but a mere complex of symptoms occurring as the result of an infection in some cases and in others as the result of a deterioration in the blood, possibly also an altered condition of the blood-vessels or both.

ASSOCIATION OF AMERICAN TEACHERS OF THE DISEASES OF CHILDREN.

*Proceedings of the Fourth Annual Meeting, held at St. Louis, Mo.,
June 6, 1910.*

The President, ALFRED C. COTTON, M. D., in the Chair.

THE PRESIDENT opened a

SYMPOSIUM ON THE TEACHING OF PEDIATRICS

by an address on

THE TRAINING OF THE PEDIATRIC NURSE

The training of the pediatric nurse is a matter to which my attention has been seriously called, as I have watched pediatrics grow more and more important. Beginning as almost nothing in a favored center it has advanced to an important branch of teaching, as witness the journals and organizations devoted to pediatric teaching. I voice the experience of those who work in pediatrics when I state that a positive obstacle to successful practice among children is the want of skilled cooperation on the part of the nurse. Graduate nurses who have had most thorough training in surgical and medical specialties frequently fall short in the care of the infant or young child. Those who practice among children could well turn to the subject of the special training of nurses in the care of children. I have lectured for many years in the Illinois Training School for Nurses, the Presbyterian Training School, and have delivered occasional lectures before other associations and at various hospitals, and I have sometimes asked the privilege of devoting an hour or two to pediatrics. Dr. Effa Davis gives a course in her hospital for the training of nursemaids and a number of the members of this Association have been asked to lecture to those nursemaids for children.

Whenever I have had an opportunity I have tried to call attention to the advantage of special training in the care of infants and children. I can already see some fruit from these efforts. I presume these same conditions obtain in other cities. In talking with local physicians in villages and small cities I find there is a demand for nurses specially trained in the care and management of infants and children, and I have encouraged local physicians to select some nurse specially fitted for this work to go to some center and take special training in this line. I believe Chicago is proud of the advanced work done in the summer colonies. In eleemosynary institutions, in fresh-air camps and sanitariums, most of the nursing is purely voluntary. As superintendent of the Jackson Park Sanitarium it has been my duty to see that nurses are supplied. At the hospital, open two months only through the year, we had 108 in attendance, and the number of out-patients I do not know, but it afforded quite a clinical field. In obtaining nurses the superintendents of training schools were selected in whose curricula the opportunities for nursing children were scanty. Some of our hospitals have no children's ward. A nurse may be an excellent surgical nurse and yet have come in contact very little with diseases of children. It is easy to convince the superintendents of such hospitals that it will be a rounding out of the training of these nurses, and so the hospitals have been glad to send their nurses to the Jackson Park Sanitarium for part of their training. I offer this suggestion for those who live where the wards of their hospitals furnish inadequate training in this branch of nursing. Nurses of several years' experience sometimes voluntarily do this work in order to round out their training. It is our duty and privilege to arouse enthusiasm in the training of nurses in the care and management of infants and children.

Along this line I can hardly forbear to call attention to the transitional condition of the practice of medicine to-day. The older practitioners have seen this radical change on the part of the laity, although the younger members know it only by tradition. But those who have practised medicine twenty or thirty years can feel this change as we feel the swelling of the ocean, a wave that is very evident. In the last twenty years the layman has become interested in health and hygiene. Almost every organization of a sociological character has an element of hygiene, of sanitation, all of which means prophylaxis against sickness and an effort to maintain health. It crops out in the health depart-

ments and charitable movements and its power and influence is tremendous, and it is all focusing toward a single point: the physical uplift of humanity, and the laity have wakened up to it. We see it in the development of cults, whether it be Christian science or any other fad, that divert attention from the old methods, and the physician of to-day who attempts to establish himself along the lines of his grandfather finds it very difficult. The question is, will he adjust himself or will he fail? When the boards of health through the money contributed labor to eradicate and to prevent disease, and when this tremendous energy, backed by money power and urged on by danger to the community, is furnishing capable men, men capable of organizing large movements, the physician looks about him to see if there is anything for which he may accept a fee unless it is as an expert witness, or as examining physician for a life insurance company, or as a contract physician for some organization. It is pertinent to the question that hand in hand with the doctor goes the nurse. We are the apex of the flying wedge that must be driven through the obstacles to the solution of these questions. The profession of medicine must turn its attention to the study of the prevention of disease immediately and must demonstrate that the science of medicine enables a physician to aid in the prevention of disease, to make him the adviser and custodian of the family health, after the manner of the Chinese method of keeping people well. It is related that the Chinese, in some parts of their country, pay an annual stipend to the physician, deducting a certain amount for every day of illness. The idea that the physician must receive a fee only for keeping people sick is something the people cannot tolerate.

It seems to me that the old family physician is the physician of the future, he is the physician to the children of the household, whose duty it is to smooth the way to proper development, to safeguard the family health, to control the household sanitation, and when he demonstrates his utility in this relationship, when his success is apparent, he will receive a fee gladly paid. There are physicians in this room who have families who depend upon them absolutely for everything relating to the health of their children, who pay their bills and do not look upon the physician as a repair wagon to be sent for when help is too late. The preservation of the family health will hold the family physician still at the head of the science he has attempted to learn. He will not be displaced by the school examining physician, perhaps his

student, or some old broken down physician who, through a political pull, has a position on the health board; he will not be displaced by some young doctor who comes into the neighborhood because he will have mastered all that pertains to prophylaxis and his reward is sure. The practitioners among the diseases of children are to demonstrate the success or failure of this new movement, and the teachers of the diseases of children would do well to call attention to the fact that the old, legendary doctor is a thing of the past and is gone. The pill-bag is of little importance. The new sanitation and hygiene and all that pertains to the family health belongs to the pediatricist and to nurses familiar with the nursing of children and with sanitation and hygiene, capable of going into a household and taking entire charge of that household, and I hope to see the time come when this will be an important part of pediatric work.

THE ADVANTAGES OF SPECIALIZING IN PEDIATRIC PRACTICE.

DR. HARRY M. McCLANAHAN.—Medicine has an honorable and ancient history. Its growth during all the centuries has been constant, even during the dark ages there was steady progress. This growth has been along many lines until the science at its periphery comes in contact with all science and in its practice employs many means and influences mankind in various ways. But for medical science the Isthmian Canal could not have been completed. Commerce owes more to medicine than to business sagacity or capitol. Because of this great growth and expansion the practice of medicine demands such technical knowledge and skill that no one individual can become proficient in all branches of practice, hence has arisen the necessity for specialism in medicine.

Has pediatrics attained sufficient growth to warrant it to be classed with the specialties of medicine? If it is not large enough to engage the time and thought of educated men then it should not have a place with the other specialties. In my opinion the majority of physicians do not think this branch of sufficient importance to be ranked with surgery, gynecology, or ophthalmology. The majority of physicians believe that diseases of children should come within the province of the family physician and resent sometimes bitterly the suggestion that this specialty should take rank along with other departments of medicine. Outside the larger cities I am in entire accord with the view that children should be treated by the family physician. In the

smaller cities and country it is neither practical or necessary for physicians to limit their practice to infants and children.

Those who feel that pediatrics should not be recognized as a distinct department of medicine fail to appreciate either the importance or extent of the subject. The majority of our profession do not distinguish the difference between pediatrics and diseases of children. In view of the fact that in the majority of medical schools this chair is designated as that of diseases of children, it is not strange that the majority of our profession should fail to distinguish the difference. By "diseases of children" is meant the diagnosis and treatment of children when sick. Pediatrics pertains to the child in its entity. It includes all that relates to its prenatal life, its uterine life, and its separate existence. It relates to heredity, to development both mentally and physically, to its nutrition, to its mode and manner of life, and its education. The science of pediatrics is therefore as broad as life itself. There is no elementary branch of medicine and no department of its science that does not have a very intimate bearing upon and relation to this branch.

Our knowledge of infections, of immunity, of compliments, of diathesis, of predisposition find there widest application among diseases of children. The broad subject of heredity, its influence both during intra- and extrauterine life, the various means used to overcome and neutralize the dual influence of heredity, its influence upon the nervous system and upon bodily growth present problems for careful study. The relation of environment to physical and moral growth of the child come within the domain of this department. The influence of poverty associated as it is with the lack of sunshine and air and bad food is now well recognized in infant morbidity. While I do not minimize or criticize the work of humanitarians and sociologists I am convinced that the scientific direction of this work should come from the pediatricist. This work lies at the very foundation of the nation's stability. Much of the effort and money now expended both by municipalities and individuals is wasted because of the lack of intelligent direction.

Until recently our knowledge of infant physiology was purely empirical. Even yet this rich field is only beginning to be explored. I am glad indeed that some of the younger members of this society are intelligently taking up this work. The whole great subject of metabolism must be studied in the light of the infant. The work of Rotch opens up a new field and the study

of comparative anatomy by means of the *x*-ray is destined to have beneficent influences both in the industrial and school life of the child.

Pediatric surgery deserves more consideration. Conditions due to defective cerebral development and perverted internal secretions offer new fields for exploration. All honor to Dr. S. W. Kelley for leading the way in this important field.

In spite of the voluminous literature few men to-day in general practice realize the importance of nutrition or correctly apply the knowledge of facts now known. All fundamental branches of the science of medicine have a direct and practical bearing on the subject of pediatrics. Many more facts might be cited if necessary to prove the bigness of the subject.

Now if we have shown that pediatrics is worthy of being recognized as a specialty from the scientific standpoint, what about the practical side of the question? The pediatricist cannot live upon science and good works. The field must be wide and fertile enough to properly maintain him. It is doubtless true that other specialties offer larger pecuniary reward and no doubt surgery, internal medicine, and gynecology and ophthalmology ever will offer greater remuneration. We all realize that men to some degree are measured by their earning ability. This spirit in our profession is dangerous and when rated as the chief object of a physician, tends to subvert his higher impulses, for money is not the only or best measuring rod. There are to-day, and doubtless ever will be, men of broad attainments and high ideals who will enter the profession for more worthy motives than those of pecuniary gain. We need not fear but that the pediatricist will receive just remuneration, and that his work will amply maintain him. However, his best effort and his highest pleasure will be in the uplift that his work will give to society. As I have said, the ordinary diseases of children will in the future be treated by the family physician and by the application of the increased general knowledge acquired by the work of the pediatricists the family physician will in future do better work than in the past. The pediatricist's highest usefulness will be in enhancing the knowledge of the treatment of children, and hence the lessening of infant mortality and morbidity.

There will yet remain a distinct work for the pediatricist, a work for which he will be properly fitted, a work in which his training will give him keen delight, and a work that will bring him a just reward. The surgeon is not called upon to treat

every case of surgery, nor the ophthalmologist every eye case, nor the gynecologist every uterine case, neither should the pediatricists expect to treat every case among sick children.

First, as a consultant. In this capacity he will be able to aid the family physician in serious cases. How many infants are lost during the first year of life because of some diseases of nutrition? I will not weary you with statistics, but it has been conservatively estimated that 50,000 infants perish annually in this country from preventable causes; again, how many survive the first year with a miserable existence that handicaps the future life? In the whole range of infectious diseases wise council is frequently necessary? As a consultant the pediatricist of the future must have very exact knowledge of the child as a whole, also a special knowledge as well of the eye, ear, nose and throat, and the ability to properly examine the same. Already the value of the ophthalmoscope as an aid to diagnosis is realized and I express a conviction that if it were used in routine work it would throw a flood of light upon many obscure cases. To what extent he will practise this work each must decide for himself. In the future the consulting pediatricist will have as wide a field and will be a man equal in attainments to the internists and surgeons.

The pediatricist must also be an investigator, he must do hospital work, and the child's hospital will not only be necessary to the care of children but will be vital to the growth of this department of medicine. The lay public must be taught that original work in no way injures the child nor delays its recovery. The child's hospital of the future will be more than an eleemosynary institution. This it will be and also it will be needed for the care of the prosperous in both medical and surgical departments, hence the child hospital will be a field for research.

In conclusion the advantages of pediatrics as a specialty may be briefly summarized as follows:

1. It offers a reasonable pecuniary reward.
2. It demands a broad culture, a wide scientific knowledge, including careful laboratory [training and bedside clinical experience extending over a period of years.
3. It demands the development of a keen power of observation. Physiognomical diagnosis is nowhere so important. But all facts must be weighed before a conclusion is drawn.
4. Sound judgment in analyzing symptoms is more necessary

here than in other departments of medicine in order to arrive at a correct conclusion.

5. A wise tact and a pleasing personality in order to enable a physician to examine a child is a necessary qualification to the largest degree of success.

6. More than in other branches of medicine practice in this department gives a real satisfaction and a deep sense of pleasure, due to the knowledge that humanity will be made better, life saved, and sorrow lessened.

7. Sterling honesty is a necessary qualification of a pediatricist. The proper treatment and care of the child deserves the highest qualities of head, hand, and heart.

THE TEACHING OF THE SURGICAL DISEASES OF CHILDREN.

DR. EDWARD J. WYNKOOP.—One has but to glance over the record of the past ten years to realize the great changes that have taken place in the methods of instruction in the medical colleges of this country during that time. The "Diploma Mill" has practically ceased. The standard set for modern medical teaching requires laboratory and clinical facilities of the greatest efficiency and the medical school that cannot furnish these must close.

During the entire medical course the effort is now made to bring before the student a proper understanding of each subject from the foundation up. Beginning with the laboratory and ending at the bedside the subjects are presented in as clear and practical a form as possible.

As teachers of one of the most important branches of medical science do we sufficiently emphasize the fact that our subject is practically the foundation of medical practice? Furthermore, do we as teachers of the diseases of children dwell upon the surgical diseases sufficiently?

The term pediatrics as usually given relates to the medical diseases of children, but are the peculiarities of infancy and childhood only seen in medical diseases?

Malformations and defects, tumors and deformities (congenital or acquired), and other surgical diseases are just as important and require just as much special adaptability, fitness, and training in the man who diagnoses and treats them as in the man who diagnoses and treats some of the unusual medical diseases.

Too often by the term pediatrics is meant the care and feeding of infants and but little else. Such a division is untenable, for in

a proper conception of the term the broadest meaning of the word pediatrics should be clear to an instructor's view, even if in practice it may at times be wiser to limit his practice to the medical side.

Do not understand me as wanting to have pediatrics enter the field of general surgery, but should not the surgical diseases of infancy and childhood be taught as such and in conformity with the medical side and not scattered unsystematically through general and orthopedic surgery, nose and throat and other departments?

In going over the literature of this subject one is surprised to find how much has been written on the importance of children's surgery, and it is difficult to conceive why this field has been so long overlooked and neglected.

Are we not justified in requiring that due consideration be given this important branch?

How much better would it be to have some arrangement of the teaching schedules so that the surgical as well as the medical diseases of children should receive proper attention?

This could be done by having the surgical department work in connection with the pediatric department and have the clinical material shown in some relation to the medical clinics.

Accept the surgery of infancy and childhood as a well established fact and give it a proper position in the teaching of the diseases of the young.

There is no question but that the man who attempts to either teach or practice children's surgery must be well grounded in medical pediatrics as well, for the subject is so broad that it can only be handled by one who is thoroughly prepared in all departments of the work.

The late Dr. Charles Fayette Taylor is credited with the statement that orthopedic surgery is the broadest of all the specialties. Certainly, were it not for the surgery of children orthopedics would occupy a much smaller field.

The question of the development of the bony structures, the prevention of deformity from faulty weight-bearing, posture, or occupation, cannot and should not be of interest only to the orthopedist. In injuries of the bones, fractures, epiphyseal separation, dislocalities the best results are obtained by the one who recognizes and treats not only the immediate injury but the general condition of the patient as well and who recognizes the diseases that may underlie it and be ready to act accordingly.

One could go on indefinitely and enumerate many reasons why surgical diseases of children should receive more recognition, but the object of these remarks is to call to your attention the neglect of this subject by pediatricists and to have the teaching of the entire field of children's diseases placed in its proper position.

The points to be emphasized are these:

1. In teaching the diseases of children the medical and surgical sides should receive equal attention.
2. Should it be deemed wiser the surgical diseases could be taught as a department of general surgery but should be in accord with the medical side so that uniformity of teaching would result.
3. The surgery of children requires of the man who devotes his time to it special training and adaptability.
4. The teaching of the diseases of children so that the medical and surgical division receive equal recognition will greatly facilitate the easy grasping of the subject by the student.
5. The training thus given students will better fit them for entering the field of medicine.

IN WHAT DEPARTMENT AND BY WHOM SHOULD THE SURGICAL
DISEASES OF CHILDREN BE TAUGHT?

DR. SAMUEL KELLEY, Cleveland.—What should be done in the teaching of the surgical diseases of children is indicated by a study of the conditions as they exist and by experience of what has been found expedient in other departments of learning in order that we may proceed as best accords with approved customs and methods already established.

The medical side and the surgical side of pediatrics are very closely related. This is true also of general medicine and general surgery and of the specialties, and it is a mistake to consider them as entirely separable. Each must be taught with due regard to proportion and to its relationship to the whole.

In practice as now carried on in the large cities, division into specialties obtains to a greater degree than in smaller cities, towns, and rural regions; and when we come to the work of the medical college the various subjects are still more sharply divided than they are in practice, because a division of labor of teaching is necessary and leads to the most systematic and effective work.

For purposes of practice, for purposes of study, for the convenient division of labor in medical schools and in hospitals, it

has long since been found expedient, notwithstanding their close relationship to divide medicine and surgery. The reasons for this are too numerous and too familiar to need reviewing here.

As to the present distribution of clinical material, as you are aware, in general hospitals the surgical material among the children customarily falls to the surgical service; while in children's hospitals the staff usually contains both physicians and surgeons who divide the work. Consequently the material available for teaching surgical pediatrics is mostly in the hands of the surgeons upon the staff.

Just as the work of the general practitioner gradually became differentiated more and more into its medical and surgical aspect so will the work of the pediatricist. We are now in a transitional state.

Up to the present time children as a class have been more thoroughly and extensively studied by physicians than they have by surgeons.

Inasmuch as children have been more closely studied as a class by medical men it is probable that during this transitional or developmental period some teachers will combine with their medical pediatrics a love for and a knowledge of its surgical side, and in that particular college surgical pediatrics will be taught in the department of the diseases of children. "As to whether one man can practise (or teach) successfully both medical and surgical pediatrics" must depend upon circumstances and the man.

But judging from the history of the past and from the present situation of affairs, I believe that ultimately it will be found expedient to divide the broad subject of pediatrics in the college work, and surgical pediatrics will be regarded as a special branch in the surgical department, grouped with gynecology, orthopedics, and genitourinary surgery.

For the present it seems wise to adhere to the recommendations which were adopted by this Association at its meeting in Atlantic City, June 7, 1909. The paragraph bearing principally on this topic is as follows: "The course (in pediatrics) should include the anatomy and physiology and all the ordinary abnormal conditions of infancy and childhood both medical and surgical. When preferred the surgical side may be taught in the department of surgery, but it should not be ignored or only casually referred to as it usually has been."

In the Association of American Medical Colleges the Committee

on Curriculum for the third and fourth years has adopted the same view, and its report recommends that attention be given to children's surgery, and on this particular point says "The surgery peculiar to children may be given from the chair of pediatrics or from the chair of surgery."

PRACTICAL METHODS OF SECURING CLINICAL TEACHING OF
THE CONTAGIOUS DISEASES.

DR. FRANK H. LAMB, Cincinnati.—The subject which has been allotted to me in this symposium is one of the most neglected in the teaching of pediatrics.

I shall not enter into a discussion of the relative value of didactic and clinical instruction in the teaching of contagious diseases because I believe we all realize the futility of attempting to describe even a typical case of any of the exanthemata so that the mind of the student may grasp it.

The variation in size, shape, color, elevation, distribution, and amount of the exanthem in the individual case make the word pictures difficult indeed.

The use of printed pictures, charts, and wax models help to convey our meaning, but even these fall far short of nature herself.

Several methods of clinical teaching of the contagious diseases suggest themselves:

The dispensary.

The amphitheater.

The bedside in the contagious wards.

The first two methods offer many advantages over the didactic lecture, but are inadequate in themselves.

The cases which present themselves to the dispensary are few in number and usually cases of diphtheria or the milder contagious diseases which do not have an exanthem, that is mumps and whooping-cough. Occasionally cases of chicken-pox and German measles are seen in the stage of exanthem.

Measles is generally seen in the preexanthem stage. The onset of scarlet fever is so severe that few of these cases reach the dispensary. When, however, any of these cases do reach the dispensary as soon as the diagnosis is made they are reported to the board of health and are either sent to the contagious wards of the hospital or isolated at home and are lost to the dispensary for teaching.

The teaching in the dispensary is limited to the milder contagions, to atypical mild forms of severe contagions, and to the early stages of the exanthematous diseases.

The hospital amphitheater lecture as a method of clinical teaching is a step in advance of the dispensary because the diseases can be demonstrated in their various stages from the onset to the complications, and the student shown a complete clinical picture.

The objections to this method are the infecting of the amphitheater and the difficulty of proper clothing and disinfection for the entire student body after close inspection of the cases.

The third method of clinical teaching of contagious diseases suggested, the bedside instruction in the contagious wards, is in my opinion the best and most practical method.

The upper class-men should be divided into appropriate sections and assigned in rotation to the service. They should visit the contagious wards with the staff twice a week for a period of at least six weeks. They should be brought into intimate relation with the service throughout their entire course, observe the management, and follow the treatment.

In the larger cities this method is practical if the contagious hospital or contagious wards of the municipal hospital can be utilized for teaching purposes. If these wards are not available the colleges should establish contagious wards in connection with the hospital used by them for clinical teaching. Wards for the ordinary endemic and epidemic contagious diseases should form a part of every well-equipped college hospital.

ON THE INSTRUCTION OF STUDENTS IN THE PRACTICAL
WORK OF PREPARING FOODS AND ADMINISTERING
THEM TO INFANTS AND CHILDREN.

DR. J. WARREN VAN DERSLICE, Chicago.—One of the most valuable things in the course of instruction in pediatrics is that relating to the methods of preparing and administering food. Of course teachers will instruct more or less in the method of feeding that they use to the greatest extent. I believe students should be taught cow's milk analysis. They should make their mixtures not by the usual laboratory methods, but by using the utensils that are in the hands of every mother. Practical experience in making the various cereal waters (gruel) will impress more than didactic teaching. In that way we can bring more potently to his mind that these cereal waters are of very

little food value, which is not instilled into the minds of all students. We should decide on the definite amount of proteid and the definite amount of cereal, etc. Then, about the broths. The medical man who does not feel that there is food value in broth is not common. Then, students should be taught to make expressed beef juice, and cream and whey mixtures should be prepared, the preparation of peptonized milk and its technic should be taught. These things come before the student after his graduation. He is asked how to make these things and it is not pleasant to have to explain that the method is to be found on the bottle. I think that the preparation of certain often used proprietary foods should be explained and that the medical man should know just what they contain. To ridicule them does not have much effect.

THE MILK LABORATORY AS A TEACHING FACTOR.

DR. HENRY W. CHENEY, Chicago.—I shall begin with the statement that the pediatric department of a medical college is not complete unless it has a well-equipped milk laboratory, closely connected and actively cooperating with it.

On inquiring, however, I find that in Chicago this condition exists in only one of the medical schools and also that in other cities of this country the medical school milk laboratory is the great exception rather than the rule.

Such being the case, a description of the practicability and usefulness of the diet kitchen at Northwestern University Medical College should be of interest.

Our laboratory has now been in operation about seven years. It occupies two room immediately adjoining the department of diseases of children.

It is in charge of a graduate nurse who is paid a salary. She has as assistants two or three nurses assigned from three or more of the hospitals of the city who serve for a certain period and thus secure their training in the dietetics of infancy.

Prepared feedings are supplied to all the dispensary babies who are being artificially fed—to the babies at Wesley Hospital, adjoining, and also to a few of the private patients under the care of the doctors connected with the college. Thus we have from twenty-five to forty artificially fed babies under observation at all times and this is not only a benefit to them, but these cases make good clinical material for teaching.

As to the kitchen itself, there is one large well-lighted room finished in white enamel paint about 20 feet square containing work table and prescription rack, running water, large ice-box, small gas stove, desk, etc.

A smaller room contains a large sink for washing bottles, two steam sterilizers, and a large gas stove.

I need not enumerate the smaller utensils and supplies which are much the same as usually found in such diet kitchens.

The milk we use is all certified milk which we are able to purchase at wholesale rates. Our bottles for dispensing are all made expressly for us and have a special neck so they can be stopped with a round pasteboard cap, the same idea as in the large milkmen's bottles, this being more effective and economical than using cotton as a stopper, as was formerly done.

When the patient first begins at the diet kitchen a deposit of one dollar is made to cover cost of bottles, wire carrying rack, nipples, breakage, etc. Thereafter a small amount is paid each day to cover the cost of the feedings. If patients are very poor and are worthy they are furnished the outfit and given the milk daily without cost to them.

We also do something at this laboratory which, so far as I know, is absolutely unique compared with all other such institutions. We furnish modified *human milk* to some of our babies. We engage regularly one wet-nurse and sometimes two to supply us with breast-milk. The nurse we have now milks twenty ounces from her breast daily which we thus obtain for use. This is modified to suit the individual need or small amounts added to cow's milk feedings and supplied to some of the private patients or to a few of the dispensary patients who must have it in order to thrive.

Now, from the practical side, you will inquire, how is the expense of such a laboratory provided for?

The college made the appropriation to furnish the rooms in the beginning and since then the laboratory has been partly self-supporting.

The total expense of the diet kitchen each month is about \$250, which includes the salary of the superintending nurse, \$85 a month.

Against this the receipts from milk sales averages \$135 per month, leaving a monthly deficit of about \$115.

The wet-nurse is paid \$8 a week, and is given two or three feedings daily for her own babe.

The human milk account is kept separately and enough is charged for feedings containing this milk to care for the expense of it.

There is given away each month \$20 or \$25 worth of milk feedings to poor patients unable to pay, so that we see that aside from the amount of this charity and the nurse's salary the laboratory is practically self-supporting.

The college feels that whatever shortage there may be in this work is more than made up in the increased efficiency and usefulness of the children's department as a whole.

And now, finally, as to the teaching value of such an institution.

From the standpoint of the nurses, they have experience in milk manipulation for babies, which certainly is a valuable and necessary part of any nurse's training.

From the standpoint of the students. When the diet kitchen was first started the plan was adopted of assigning one or two students each day to assist the nurses in doing the actual work of milk preparation.

This was found to be impracticable after a time, because the work of these men had to be so closely watched to prevent mistakes and also much time was consumed in repetition of instruction.

More recently we have tried the plan of having one of the instructors take a group of six or eight men through the laboratory showing the outfit and explaining methods, etc.

This, however, is still not ideal and we may add to this by assigning a half dozen students once a week to the laboratory and let the superintending nurse give them a demonstration of the various steps in the modification and preparation of milk foods.

Beside this, when the feeding cases come to the dispensary the physician writes an individual milk prescription for each case and explains this to the students and he does not have to depend on the already prepared formulæ such as are furnished by a city milk commission or other milk agency.

Then, too, such babies are kept under closer observation than otherwise, because daily written reports are made to the superintending nurse by the mother, and the nurse can thus cooperate with the physician in their care, and the students have the benefit of this close supervision of the cases.

From the standpoint of the attending physicians, they feel that such a laboratory is invaluable, not only because it is a great aid in teaching, but because it makes all of their work of infant-feeding more effective.

INSTRUCTIONS IN PEDIATRICS TO POSTGRADUATE STUDENTS.

DR. GODFREY R. PISEK, New York City.—The past decade marks a notable change in the demands of the postgraduate student. Ten years ago instructions were mainly given to men who had been in practice some twenty odd years and who came to the school "to brush up;" this was done principally by clinical lectures given to a large group of students who attended for the purpose of picking up "new points," as they expressed it, and who assiduously copied any prescription which their lecturer happened to recite. Surgical operations were religiously attended, even though the onlooker never did any surgical work nor had any intention of so doing. Gradually there has come a healthy change and the schools have adapted themselves to the requirements of the matriculants. A younger and more virulent set of men come to our schools; some because they have appreciated the lack of clinical material at their own college or because there was a weak department in their particular curriculum. A limited number who have been successful general practitioners decided to take up a specialty and come to the large cities to prepare themselves for a certain line of work.

Instruction in pediatrics has always been popular with the general practitioner who treats a large per cent. of children in his daily work. Chairs of pediatrics have comparatively recently been established and the instruction given only now begins to be commensurate with the importance of the subject.

To provide for these students with their varying needs must be the aim of the postgraduate school. Over a decade of teaching in a graduate medical school may be apology enough for presenting my views as to how a pediatric department should be conducted in a graduate college.

The first essential is a well-equipped plant in a large center so as to provide abundance of clinical material.

The department should be so organized that a student's entire time can be devoted to pediatric work if he so chooses.

This instruction should be given in

1. The dispensary or out-patient department.

2. The ward.
3. The lecture-room.
4. Private classes.
5. The diet kitchen.
6. Infants' milk depots.
7. The laboratory.
8. The morgue.
9. The hospital (infectious diseases).
10. Literature.

The professors should be actively engaged in pediatric practice and have working under them instructors who have shown their ability to teach and who are candidates for the higher teaching positions. The dispensary should be arranged for teaching purposes by having separate examining-rooms and a common laboratory in connection therewith for the ready examination of blood, smears, etc. The student should not be asked to act as an assistant, but should be granted the privilege of examining interesting cases and make his own diagnosis. This is then discussed with his instructor who should be able to establish his own diagnosis or, if the case was a doubtful one, should be sent to the ward or asked to return for examination by the head of the department. In this way both the student and the instructor receive the aid they need.

The dispensary should be fitted with a room for applied therapeutics in which the student can watch method of procedure and actually learn how to carry out methods which he orders, trusting that the nurse will know how when he himself feels sure that his knowledge is indefinite or hazy.

The babies and children's ward should be daily visited with the attending physician who makes his physical examination and notes the progress of a case on the chart for the student to study in his leisure moments. Little discussion is possible in these rounds, but suitable cases may be assigned for the special classes which are given to small groups of students. These small classes are invaluable for the matriculant. They should not contain more than five students.

In my experience this instruction should at first be fairly elementary, all reserve is thrown aside, and the innermost deficiencies are confessed and bad memories berated.

System needs to be drilled into the men—snap-shot diagnoses, hither and thither examinations, and limited resources are the commonest failings which we meet. The interpretation of

physical signs and tests as applied to early life is often a revelation to the student, and once mastered he is ready to examine cases and report his findings intelligently to his instructor, while the entire group verify the finding and take part in the discussion of the treatment applicable. Laboratory work in connection with this course should be thoroughly practical and only such work should be undertaken as the practitioner may perform with his own office equipment.

The course of physical diagnosis is followed by instruction in infant-feeding. The student is taken into the diet kitchen where the feedings are prepared and is taught by self-made experiment the chemical and physical characteristics of milk which are of use to him in infant-feeding, such as the estimation of butter fat, acidity, reaction to alkalies, etc.

The diluents used are actually prepared by each student who thus makes himself capable of giving accurate directions to the mother or nurse. Computations can be taught in such a manner that the student is unconscious of the fact that he has been delving in mathematics and this great bugbear disappears in a halo of satisfaction, that he need depend no longer on a well-thumbed pocket formulary donated by a proprietary food company. At the end of the course the class goes into the ward and applies to feeding cases the facts learned and critically examines the stools and weight in relation to given feedings.

A milk depot, which is managed in connection with the hospital, serves as a further instruction port after the course is finished; in these consultations he can watch a large number of feeding cases and note the results of home modifications and mixed feedings.

No course in pediatrics would be complete without necropsy work; in the morgue the anatomy and pathology of early life can be best impressed and the material can then be used for intubation, tracheotomy, and lumbar puncture operations, fitting the student to perform these under the guidance of his instructor on the living subject when opportunity offers in the wards.

The younger men particularly crave inspection in the infectious diseases and classes should be taken into the wards, not for a limited inspection, but for close study of the protean character which such a disease as scarlet fever, for example, may assume.

Throughout this course the student should be guided in the proper channels of pediatric literature; his instructor can pick

out the wheat from the chaff and place in his hands helpful articles and teach him how to discriminate. Attendance at pediatric societies should be encouraged so that he may become familiar with the proper method of presenting a case or the preparation of the monograph.

That such work is satisfactory to the student is attested by the increasing number which apply for instruction, but that the greatest gainer is the teacher is no doubt the experience of every one of you.

DISCUSSION

DR. CHARLES DOUGLAS, Detroit.—I have never listened to pediatric papers with greater satisfaction than I have this last hour. The teaching of pediatrics I was anxious to have discussed to bring up the difficulty of the work assigned to us and whether it should be done by the didactic method or in what way. The teaching of surgery and medicine together in the pediatric course presents difficulties. It is a subject that would have to be treated in each individual college, being combined in some and separated in others. There is no doubt that the subject of pediatric surgery should be brought out more prominently. It is not often that the surgical work is presented in such a way as to make it thoroughly instructive. Again, those teaching pediatrics want a clearer idea of the origin of surgical conditions. I am impressed more every year with the importance of nutrition in relation to pediatric surgery. I cannot help thinking that many of our authorities do not bring that point out strongly enough. We do not realize how important it is to treat surgery from a nutritional point of view, in other words to avoid the necessity for surgery by proper nutrition. The question is, are we keeping up with the subject as we should?

DR. H. M. McCLANAHAN, Omaha.—One phase of this question seems to me of special importance. When a child comes to me with a surgical and medical condition the surgical work must be done and must be done well, and I think that the English idea is correct, that when a child presents itself with surgical condition you have absolute control of that child. When a case comes to you you are the master of that case. It may require one kind of surgery or another kind of surgery, but you should have control of that case long enough to get the secondary beneficial results of surgery. The surgical procedure is only a part of the treatment and not the whole of the treatment. We should bear in mind that we are in control of the case, and if surgery is needed we should have the surgery done. In this country the surgeon has taken such prominence that he has exceeded his power and his duty often to the detriment of the patient. I feel that I want to control my case whether it be a surgical case or not.

DR. G. H. CATTERMOLLE, Boulder, Col.—I speak from the

standpoint of a physician in a small town and I have been impressed with the discussion on the methods of teaching students. In the small towns we have no nurses. It devolves upon the mother to nurse the child, and it devolves upon the physician to instruct and teach the mother. Unless we teach the student in a practical way he is unable to give instructions to the mothers in a practical way. You who have clinics and laboratories have the advantage over the country practitioner, but thorough training in these methods is what the country physician needs. The children in these country towns get deplorably little care, yet all that the mothers need is instruction, for they are willing to do all they can.

DR. FRANK ALLEN, Chicago.—I might offer one suggestion to the paper read by Dr. Lamb on the methods of securing clinical teaching of contagious diseases, and that is to mention a method that has been employed by Rush Medical College for twenty-three years. The doctors in that institution have been asked to take students to their private cases and, those who are willing to do so, register their names at the office. I have taken students out to such cases. When I notified the office that I was prepared to take students to such a case two or three students were immediately sent out to me.

DR. S. W. KELLEY, Cleveland.—A similar plan has been used in our town. At the dispensary in the department of children we have two assistants and students are sent with an instructor to the cases at home. Not all cases in our city are required to go to the municipal hospital, but many are allowed to be treated at home and this gives our students an opportunity to see the cases at home and how they are treated at home, the instructions to the mother, the method of isolation against contagion, the notification of the health board, and all that. This utilizes another class of cases than those in the hospital which are comparatively easy to see. These students see the cases with an instructor or an interne.

DR. ROBERT BLACK, Chicago.—I would like to emphasize two points brought out by Dr. Pisek, first, the increasing number of students seeking postgraduate work and then the increasing number who are interested in the methods of feeding. Now students come in and ask your method of feeding instead of asking for a prescription. In the diet kitchen for the first few days you will have difficulty in keeping their attention but after a week they will listen attentively while you say a great deal in regard to the diet.

DR. LAMB, in closing.—The method of sending students to the houses is a very difficult one to carry out, *i.e.*, to get the students together and get them to go. I was glad to see an article a few days ago urging a contagious ward in the hospital for such diseases as chicken-pox, etc. In Cincinnati we have no difficulty whatever in caring for these diseases and it centralizes things. The students can be taken first through the non-

infectious ward and then can be carried over to the other. We have depended upon our junior ward for the teaching of these diseases. I was particularly pleased to note that such stress was laid upon the power of diagnosing these cases in the early stage when the beginning treatment is most important.

DR. PISEK, in closing.—I have had much experience in teaching the methods of modification of milk and we have given up the wholesale modification of milk. The wholesale modification of milk does not lend itself as well to teaching purposes as the home modification method. When this method is understood, if there is a nurse in charge, the doctor will order the feeding and the nurse will teach the mother up-stairs and the mother down-stairs how to prepare the food, and it thus spreads information better than if we had merely taken care of the one baby. If a bottle of prepared milk is placed in the mother's hands is it of no benefit to anyone but to that particular baby. If the student sees this home modification he is impressed and realizes the advantages of the method. As to the surgeon in pediatrics, such a man must be a capable pediatricist and then have the capacity and ability to do good surgery. If we have such a combination then we have the right man.

DR. WYNKOOP, in closing.—It all goes back to the statement that we do not give enough time to the teaching of pediatrics in the colleges. Whether medical or surgical, we should devote more time than we do to the instruction of the student in diseases of children.

DR. CHENEY, in closing.—As to the home modification of milk in contradistinction to the laboratory modification, each has its advantages. There are those who cannot come to the laboratory for such feedings and in those cases we do not feel such confidence in the results as when they can come to the laboratory. We feel that the student himself is better instructed in seeing the work done in the laboratory.

DR. PISEK.—I do not think Dr. Cheney quite understood me. The mother is shown by the doctor or nurse with all the apparatus just how to do this work in the home, and there is no reason why the doctor should not know just what the modification is. In the laboratory we deal in quarts and gallons.

DR. CHENEY.—But it is not in quarts and gallons that we do the work. The feeding for each patient is prepared separately.

DR. A. C. COTTON, Chicago.—I have been instructed and edified by the papers presented here this morning. I never heard a set of papers of more interest and I want to compliment the organization on having such an efficient secretary in making the choice of contributors to the program. I failed to hear anything about the analysis of milk. Dr. Cheney's laboratory is world-famous and is doing splendid work. The argument in favor of the home modification of milk is practical and appeals to me from my experience. Along the line of pediatric nursing nothing is more important than that the nurse should be sufficiently

trained in the modification of food. This training they get in any children's hospital or sanitarium, but the outside nurse does not get such training. In the smaller cities where they have not the advantage of this training, if the doctor's wife will let him, he should select some nurse interested in pediatric work and give her special training. The analysis of milk may be made with a cheap centrifuge and the estimation of solids should be taught not only to students and postgraduate students, but to nurses. For the past five years Dr. Allen has been doing that work in my dispensary, demonstrating to the nurses the analysis of milk, so that the nurse may make the analysis just as the nurse has been taught to make an ordinary simple analysis of urine to save the practitioner's time. I remember very well when nurses first began to take temperature; now they all do it. I remember, too, the bitter argument against nurses giving a hypodermic, and I remember the time when no nurse understood the technic of lavage or gavage. Now every nurse has her thermometer and hypodermic and is familiar with the method of lavage and gavage. I have one nurse who can make a lumbar puncture, but I am not prepared to say that this should be taught to all nurses.

(*To be concluded.*)

BRIEF OF CURRENT LITERATURE.

Treatment of Chorea with Large Doses of Arsenic.—G. B. Hassin and A. S. Hershfield (*Med. Rec.*, July 2, 1910) report favorable results from the use of arsenic in large doses in chorea as recommended by Comby and Filatoo. They employed a solution of arsenous acid, 1:1000, beginning with one-half teaspoonful and increasing the dose by one teaspoonful daily up to five teaspoonfuls. This method has been used by one of the writers in private practice among poorly trained mothers for three years without serious and with few unfavorable symptoms. Arsenical treatment of chorea with arsenous acid is a much safer method of treatment of minor chorea than with different arsenical solutions commonly used. It is true that complications are apt to occur, but complications are also possible with other drugs offered as substitutes for arsenical treatment. The by-effects of arsenical treatment can be greatly mitigated by using arsenous acid and can be avoided if attention be paid to the condition of the gastrointestinal and renal apparatuses.

Vincent's Angina.—In a study of thirty-two cases. J. D. Rolleston (*Brit. Jour. Child. Dis.*, July, 1910) states that Vincent's angina is an uncommon disease, occurring in 0.9 per cent. of all cases of sore throat, and in 4.9 per cent. of cases of non-diphtheritic angina. During a five years' period of observation in a hospital population of all ages, the affection was confined to children between two and sixteen years. No instances of contagion were observed. Its incidence was greatest in the spring, least in the autumn. It was not found to show any predilection for weakly children or for cases of oral sepsis. There is nothing characteristic in its prodromal symptoms. There are not two distinct varieties of Vincent's angina. The ulcerative is merely a later stage of the membranous form. Constitutional symptoms are slight or absent, but the local affection is more pronounced than in diphtheria. Association with other diseases is uncommon. The prognosis is favorable. Complications are infrequent and usually insignificant. Treatment consists in the local application of tincture of iodine or methylene-blue powder. Internal medication is usually unnecessary.

Anaphylaxis for Cow's Milk in Nurslings.—Barbier (*Arch. de méd. des enf.*, July, 1910) says that when an infant is breast-fed, he takes in a homologous albumen, but when he takes cow's milk he ingests a heterologous albumen. This is poorly assimilated, and only after transformation. Entering the blood it may produce the same phenomena as the introduction of a foreign serum. The pancreas and liver transform albumins. If they are insufficient the milk albumin passes into the blood, as has been proved clinically, and causes the usual reaction of anaphylaxis. In some cases a febrile reaction has been observed in children after taking cow's milk, and a leukocytosis not seen under breast-feeding. In some infants also there is marked intolerance for cow's milk. This is observed after some days of water diet or abstinence from milk, and its resumption must be begun with great care. This is especially true in convalescence from dyspepsias and enteritis. These accidents of anaphylaxis are observed mostly in nurslings who are fed on the bottle, and the milk of asses is better borne than that of the cow. If the dose of cow's milk be continued or increased, symptoms of general intoxication occur. Three illustrative cases are given by the author. The improvement in these cases is immediate when the kind of milk is changed. When, after a few months, an attempt is again made to use cow's milk the same result is obtained. Some infants are intolerant from birth for cow's milk; they have a congenital anaphylaxis for it. This is found in the weak, the premature, the heredo-syphilitic, the heredo-tuberculous, etc. Acquired anaphylaxis is apt to arise in children who have been overfed with milk, and is shown by digestive intolerance. Anaphylaxis is generally preceded by dyspeptic symptoms. This condition explains the extreme difficulty of

feeding premature infants on cow's milk. There can be no greater mistake in such cases than to persist in the use of such milk. If possible the child should be returned to the breast. After five or six months of age, malted gruels may be used or soups made without milk.

Treatment of Hereditary Syphilis.—Gaucher (*Méd. moderne*, July 30, 1910) says that the majority of children of syphilitic parents, even when born apparently healthy, are nevertheless infected. A positive Wassermann reaction is found in children born healthy of mothers that were infected at the eighth month of pregnancy. There are two important points in the treatment of these young syphilitics, diet and medication. It is an advantage to the infant to be nursed by his mother on account of the antibodies he may derive from her blood. It is also undesirable to allow a syphilitic child to be nursed by a wet nurse on account of the probability of infecting her. Mercury should be administered generally by mouth, the bichloride in solution of 1-1000 being the best salt to use. The initial dose is 1 milligram of mercury and this is increased progressively. The effect is much better if the daily dose be divided into several portions. It is not sufficient to treat these children when they have symptoms; they must receive a regular course of mercurials for four years at least in order to prevent any future manifestations of the disease.

Ventilation of Schools.—W. A. Evans (*Med. Rec.*, July 30, 1910) advocates reduction of the temperature of the rooms to 68° F., and raising the humidity to between 60 and 70 by introducing a spray of steam into the column of incoming air if the air is to be pumped in. If the air is brought into the room through the radiators it can be moistened by pans of water or a patent humidifier. The air should be blown out of the room at stated intervals by raising the windows while the children are out at recess. The dust content of the air should be decreased by having the students at the blackboard use an eraser which is very slightly damp. The air should be introduced into the room so as to keep the expired air as much separated from the fresh air as possible. This cannot be done if the room is heated and ventilated by the same air. Such air is introduced at 110° F. to 130° F. If it was introduced near the floor and the outlets were placed near the ceiling the hot air would rush straight from the inlet to the outlet and it would be very difficult to prevent great loss of heat. The only feasible thing to do when heating and ventilation is done with the same air is to put the hot air in high and take it out low. The more rational plan is to have the air enter directly from the outside through holes in the walls; these holes to be closed by adjustable diaphragms. The air should pass directly through radiators and be discharged into the room at such a temperature as to maintain a temperature of 65° F. to 68° F.; other radiation to be a hot water or steam gravity system. The radiators should have water evaporating attachments. The air should be introduced in the room at several

different point through ducts inside the room, with many openings in the ducts; the exits to be on the inner walls at, in, or near the ceiling; the gathering ducts to lead to the attic with the smallest possible number of turns or angles. In a windy, cold climate, the duct should lead to a central large exhaust fan in the attic. In a less cold climate the ducts can lead directly to the roof and open to the outside, surmounted with one of the perflation devices to accelerate suction and to prevent down draft. When the weather is not extremely cold, and all bends and turns are eliminated from the exhaust ducts, the fans can be eliminated. In a milder climate the ducts can be made to discharge from each room directly to the outside air, the outlet being at the ceiling line. In the far south, the windows can be used all winter long, both for inlets and outlets, with this single suggestion, that the radiators be so placed as that they will come a foot or two higher than the bottom of the window. When in cold weather the window is raised six inches or a foot from the bottom, the cold air which enters through the opening will pass through the radiation. The advantages of such a method over the present method are: Low cost of installation and of maintenance. (a) On still days the fans will not run at all. (b) On windy days the fans need only be used to exhaust the air from the rooms on the leeward side. The rooms on the windward side will exhaust without any artificial aid. (c) The volume of air needed per pupil per hour can be reduced from 2,000 cubic feet per pupil per hour to 1,000 cubic feet per pupil per hour, or even less where the foul air is removed without much admixture with the fresh.

Bruits Heard over Manubrium Sterni in Children.—J. E. H. Sawyer (*Brit. Jour. Child. Dis.*, July, 1910) has analyzed the bruits heard over the manubrium sterni in sixty-five children between two and a half and eleven and a half years of age. They were heard most often in children between the ages of four and nine. In all cases except one the bruit was louder in the neck than over the sternum. It was found that in all cases in which a bruit could be heard over the sternum it was audible in the neck, and that a bruit was often heard in the neck when the head was bent back without it being audible over the sternum. The conclusions arrived at from these facts are that in many children a bruit is produced in the internal jugular vein by the head being bent back and that it depends upon the loudness of the sound whether it can be heard over the sternum. Granting that the bruits arise in the internal jugular veins it is easy to understand how they are produced. Bending the head backward puts these veins on the stretch, and causes them to be compressed against the transverse processes of the lower cervical vertebrae. The sternomastoid muscle also compresses them, for it becomes very tense when the head is thrown back in the position required for the examination. The sternohyoid, sternothyroid, omohyoid muscles, and even the platysma may help

in this compression. The stretching of the vein and its compression must diminish the size of its lumen over a certain portion, and therefore a condition is produced in the vein which is likely to give rise to a bruit. That the bruit is produced in this way is also supported by the fact that when the chin is directed to one side a bruit often appears over the side which is on the stretch. A bruit can often be made to appear in this way when previously it did not exist with the chin in the middle line. The venous hum over the sternum in children with the head thrown back appears, from these observations, to be a normal condition in the great majority of cases, and should be considered to be of no importance unless accompanied by physical signs of compression.

Vaccines in the Treatment of Bacterial Infections in Infants and Young Children.—E. M. Sill (*Med. Rec.*, Aug. 6, 1910) has treated forty-nine cases by means of stock vaccines. Of these forty-nine cases thirty-nine were subacute or chronic otitis media, the ears having discharged from a few days to two years, local treatment having had only slight effect. There was one case of erysipelas in a child one year of age, and one in an infant eight days old, two cases of multiple abscesses of the scalp, two cases of suppurating glands of the neck, two cases of pneumonia in babies, one case of gonorrheal ophthalmia in a baby of three weeks, one case of acne of eight years' standing. Of the thirty-nine otitis media cases twenty-eight were cured, ten improved while under treatment, and one did not improve. Both cases of suppurating glands of the neck and both cases of multiple abscesses of the scalp were cured. In one case of pneumonia the vaccine apparently brought about a rapid cure as the crisis came on the third day of the disease, and in the other case there was marked improvement of the symptoms. The erysipelas cases were cured. The case of acne was cured after a period of six months, having received an injection of 800,000,000 staphylococcus aureus each week. Thirty injections were given this case in all. The case of ophthalmia improved rapidly under 5 per cent. argyrol and gonococcus vaccine and was apparently cured when last seen. The earlier the vaccines were used after the discharge from the ears began the quicker was the cure, one or two injections being sufficient in most cases. Young babies seemed to require fewer injections to bring about a cure than older children, especially if the ears had been discharging only a short time. Other cases that were subacute, of a few days' duration, required numerous injections. The majority of cases showed one or more varieties of staphylococci, either alone or with streptococci. The vaccines were given in doses of from 200,000,000 to 800,000,000 staphylococci, from every two or three days to once a week; streptococci were given in doses from 40,000,000 to 80,000,000 bacteria, in some cases as often as every day, but in most cases at the same intervals as the staphylococci. Pneumococci were given in doses of 40,000,000 every day or two;

gonococci were given in doses of from 20,000,000 to 100,000,000 once a week or oftener. The clinical symptoms of each case were relied upon to determine the amount of vaccine given and the frequency of the injections. The only treatment in the otitis media cases other than the vaccines was washing the ears out with boracic acid solution.

Diagnosis of Infantile Paralysis in the Prodromal and Early Acute Stages.—W. P. Lucas (*Bost. Med. Surg. Jour.*, 1910, clxiii, 245) has studied the changes in the blood cells and spinal fluid in the early stages of anterior poliomyelitis in inoculated monkeys. The characteristic features were, in the acute stage, a moderate to a marked lymphocytosis and a marked and constant leukopenia. This drop in the white count lasted fairly consistently with the acute stage, disappearing about the time that the hyperesthesia or other manifestations of the acute stage disappeared. The average normal count of the monkeys was in the neighborhood of 20,000 per cubic millimeter. This count did not change during the incubation period, but did change occasionally during the irritative or prodromal stage, when there was a marked or moderate drop in the white count. During the acute stage there was always a marked drop, the lowest count being 8,000 on the second day after paralysis was first noted. Before inoculation it is often impossible to get even one drop of spinal fluid from a lumbar puncture. However, when successful, there were only one or two cells to be seen in an ordinary Thoma-Zeiss counting chamber, and on staining these were apparently large mononuclears or plasma cells. During the incubation period there is a marked increase in the amount of fluid and the cells are characteristically increased to from 100 to 300 cells per cubic millimeter, mainly of the large mononuclear type, with some polynuclear cells and lymphocytes. In the prodromal stage the cells often reach 1,000 per cubic millimeter. In this stage, also, polynuclears are still present, in some cases as high as 60 per cent., though the large mononuclears and lymphocytes are very evident. In the early acute stage the increase in cells is very marked. The cells are now, however, mostly of the lymphocytic or very early form of cells, and sometimes apparently undifferentiated cells. As the cells decrease in number, the polynuclears begin to return, and at the end of a week or ten days there are very few cells present, mostly large mononuclears with a few polynuclears. In the prodromal and acute stage there was at times a fibrin clot. This clot would disappear fairly early during the acute stage. Fluid in the monkeys was never under any great pressure, though the amount was sometimes increased so that 5 c.c. was easily withdrawn. This occurred fairly regularly in the meningeal type of the infection. Four cases of acute poliomyelitis in children seen first between the second and fifth day of the acute onset, all running a slight temperature and still in the hypersensitive state, with paralysis just commencing, showed from a moderate to a quite

marked drop in the white blood count, with a lymphocytosis moderately marked in all but one of the cases, which was the one examined at the latest day. The spinal fluid in two showed definite fibrin formation early, which disappeared rapidly in one and very slowly in the other. The increase in cells was marked in all at the first puncture, and in three of the cases increased slightly later on in the course of the acute stage. The increase of cells was still present in two cases as late as the twentieth day of the acute onset. The type of cells found was practically parallel with the findings of the experimental spinal fluids, the lymphocytes and small mononuclears predominating on the first examinations, later being replaced by large mononuclears, and in the last findings polynuclears were beginning to reappear.

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ORIGINAL COMMUNICATIONS.

THE CATALYTIC ACTIVITY OF THE BLOOD IN THE TOXEMIAS OF PREGNANCY.*

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IN the hope of being able to demonstrate the presence or absence of renal insufficiency in the various types of toxemia of pregnancy, we have determined the catalytic activity of the blood in a number of such cases.

Catalase is an enzyme, of universal occurrence in animal tissues, which is characterized by its power of decomposing hydrogen peroxide into water and molecular oxygen. Moreover, it has been shown that in renal insufficiency the ability of the tissues of the body to bring about such decomposition is always diminished. Consequently patients may be divided into two groups; namely, those presenting normal catalytic activity and normal renal function, and those with decreased catalytic activity and probable renal insufficiency.

The determination of the catalytic activity of human tissues by Winternitz and Meloy demonstrated that in chronic nephritis all of the tissues of the body present a diminution in their ability to split hydrogen peroxide and that this varies directly with the severity of the disease, the lowest activity

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being observed in uremia. On the other hand, in no other disease thus far investigated has a similar decrease in the activity of the enzyme been noted.

This work was followed by the study of the catalytic activity of the blood in animals in which renal insufficiency had been produced experimentally. After demonstrating that the catalytic of the blood of an individual rabbit remains constant for long periods of time, the influence of the kidney and its function upon the catalase of the blood was studied, and the following results obtained. After ligation of the ureters, bilateral nephrectomy, or the development of uremia following uranium nitrate nephritis, the catalytic activity of the blood decreases, and falls more and more as death approaches. At autopsy the tissues of such animals show a reduction in their power to split hydrogen peroxide, similar to that found in human beings succumbing to nephritis (2).

It would lead us too far afield to enter at this time upon a detailed discussion of the various factors which may influence the catalytic activity of the blood; but two of them must be mentioned, namely, the red blood cell count and the influence which certain salts exert upon this function. The catalytic activity of the blood is confined to its cellular elements, and is so pronounced in the red cells that for practical purposes all other constituents may be neglected. Although the red cell count and the catalytic activity do not vary directly, there is nevertheless sufficient relation between them to make it of the utmost importance, in the interpretation of the hydrogen peroxide splitting power of the blood, to know the number of red cells; as a severe anemia may in itself bring about a decline in the catalytic activity. At the same time such an occurrence in uremia does not depend entirely upon the anemia which may complicate the underlying nephritis.

It was also thought that the diminution in this property of the blood might be explained by the retention of certain salts, which is associated with renal insufficiency. Such a possibility was suggested by the fact that their addition to a catalase extract, *in vitro*, may influence the action of the enzyme. In order to ascertain its effect various chemicals were injected intravenously into rabbits and definite results were obtained. Such salts as sodium chloride, as well as certain acids and alkalies causing a definite decline in the catalytic activity of the blood, which varied directly with the concentration of the salt. On the other

hand, the organism compensates rapidly and soon brings about a return to the normal activity, which, however, becomes less and less complete as larger quantities or repeated injections are employed. Thus, for example, the use of 20 c.c. of a 5 per cent. solution of bicarbonate of soda causes a marked fall, but the catalytic action of the blood rapidly returns to normal and is followed by a much more pronounced decrease after the injection of 5 c.c. of the same solution (3), after which a much longer time is required for compensation.

CLINICAL APPLICATION OF THE CATALYTIC ACTIVITY OF THE BLOOD TO NONOBSTETRICAL CASES.

Method.—It is evident if the test is to be at all practicable, that a simple technic for its performance must be adopted. We have, therefore, employed a modification of the method described in detail by Kastle and Loevenhardt. In this, the required amount of blood is obtained from an ear prick by means of a pipette graduated to contain .025 c.c. The blood is immediately diluted with 10 c.c. of distilled water, making a 1-400 dilution, which is divided into two portions of 5 c.cm., each of which is placed in a 100 c.c. salt mouth bottle. One is retained as a check in case of emergency, while a small vial containing 5 c.c. of neutralized commercial hydrogen peroxide (Mallinkrodt's 3 per cent.) is placed in the other, which is connected with a gas burette. The small vial is then overturned and the bottle containing it agitated for a period of one minute. The hydrogen peroxide at once begins to decompose and the amount of gas liberated is read off every fifteen seconds. If the test be made as soon as possible (within a few hours) after the sample of blood is procured accurate results are obtained and further precautions are unnecessary.

In order to afford a basis for comparison the catalytic activity of the blood in the cases under consideration, we shall refer briefly to the results obtained by one of us in a previous investigation by means of the same technic in a series of normal, nonpregnant individuals of varying age and sex, as well as in a number of nonpregnant patients suffering from nephritis (4).

In eighty out of 100 observations upon normal individuals, results were obtained which varied within physiological limits, that is, 5 c.c. of a 1-400 dilution of blood liberated from 13 to

17 c.c. of oxygen from 5 c.c. of neutralized hydrogen peroxide in fifteen seconds. In the other 20 per cent. the amount of gas liberated in the same period varied within wide limits. These variations were independent of the number of red cells and the hemoglobin percentage; and, although their cause cannot be given at present, are of the utmost importance when attempting to interpret the results obtained in diseased conditions.

On the other hand, the catalytic activity of the blood of a single normal individual is constant, from day to day, over long periods of time. And in this way a base line can be obtained, variations from which are of the utmost significance.

In patients suffering from various forms of nephritis, our experience justifies the following conclusions:

1. Despite the presence of marked nephritis, provided there are no symptoms of renal insufficiency—that is, uremia—there is no marked change in the catalytic activity of the blood.
2. Where chronic nephritis is accompanied by indefinite symptoms of renal insufficiency, the catalytic activity of the blood will be irregular from day to day, and will tend to assume a lower level than normal.
3. In acute mercurial nephritis the catalytic activity of the blood is diminished.
4. In uremic coma there is marked fall in the catalytic activity of the blood, which continues if the condition ends fatally, but which rises should the coma disappear.
5. Retention of urine, due to obstruction in the lower urinary tract, is associated with a marked decline in the catalytic activity. This may persist for some time but will rise again should the obstruction be removed.

CLINICAL APPLICATION OF THE CATALYTIC ACTIVITY OF THE BLOOD TO OBSTETRICAL CASES.

Before attempting to interpret the results obtained by the determination of the catalytic activity of the blood in toxic conditions associated with pregnancy, labor, or the puerperium, it is important to become acquainted with its behavior under normal obstetrical conditions. For this purpose, ten clinical normal patients were studied, in each of whom several readings were made at varying intervals before, during, and after labor, but in no instance did the readings show any appreciable variation from those noted in normal nonpregnant individuals.

(These results are tabulated at the end of the paper.) Such findings suffice to show that neither pregnancy, labor, nor the puerperium produce any appreciable change in the power of the blood to split hydrogen peroxide, which always falls within the limits of physiological variation. With this as a basis, the interpretations of the readings obtained in abnormal cases will be facilitated.

We have had an opportunity to apply the test in ten cases of toxemia of pregnancy, which we here report. In seven the catalytic activity of the blood showed no changes, while in three it was found to be definitely decreased.

CASES OF TOXEMIA WITH NORMAL CATALYTIC ACTIVITY OF THE BLOOD.

The readings of the catalytic activity of the blood were as follows:

(Abstracts of the clinical histories will be found at the end of the paper.)

Case No.	Amount of oxygen liberated in				Red blood count
	15 sec.	30 sec.	45 sec.	60 sec.	
1	13.0 C.C.	16.0 C.C.	19.0 C.C.	22.2 C.C.	.....
2	19.0 C.C.	25.0 C.C.	30.0 C.C.	36.0 C.C.	.....
3	13.0 C.C.	16.0 C.C.	18.5 C.C.	21.2 C.C.	.....
4	13.6 C.C.	17.6 C.C.	20.4 C.C.	24. C.C.	3,832,000
5	13.4 C.C.	17.6 C.C.	20.6 C.C.	24.0 C.C.	4,320,000
6	15.0 C.C.	20.0 C.C.	24.0 C.C.	28.0 C.C.	.....
7	17.8 C.C.	22.6 C.C.	25.8 C.C.	29.5 C.C.	.....

The patients in cases 1 and 2 died of the toxemia and autopsy revealed typical eclamptic lesions in the liver, while the kidneys presented no signs of marked disease. The determination of the catalytic activity of aqueous extracts of the organs of these patients gave the following results:

LIVER

Case No.	Amount of oxygen liberated in			
	15 sec.	30 sec.	45 sec.	60 sec.
1	46.0 C.C.	52.0 CC.	52.0 C.C.	52.0 C.C.
2	46.0 C.C.	50.0 CC.	50.4 C.C.	50.8 C.C.

KIDNEY

Case No.	Amount of oxygen liberated in			
	15 sec.	30 sec.	45 sec.	60 sec.
1	20.0 c.c.	25.0 c.c.	29.0 c.c.	33.0 c.c.
2	16.4 c.c.	20.0 c.c.	24.0 c.c.	26.6 c.c.

SPLEEN.

Case No.	Amount of oxygen liberated in			
	15 sec.	30 sec.	45 sec.	60 sec.
1	36.0 c.c.	45.0 c.c.	50.0 c.c.	51.0 c.c.

The results obtained from a study of the catalytic activity of the blood during life and of the tissue extracts, as well as the autopsy findings are all in agreement. That is to say, there being no renal insufficiency, there was no decrease in the catalytic activity of either the blood or the tissue extracts, which is in marked contrast to the results obtained in the cases of chronic nephritis and uremia, uncomplicated by pregnancy which have been previously reported. In them, accompanying the renal insufficiency we were able to demonstrate a corresponding decline both in the activity of the blood and of the tissue extracts.

In the two fatal cases here reported three points are positively demonstrated.

1. The patients died of eclampsia.
2. The eclampsia was independent of renal insufficiency.
3. The absence of renal insufficiency, shown before death, by the normal catalytic activity of the blood, was substantiated by autopsy findings.

Cases 3, 4, 5, and 6 recovered. All the signs and symptoms of the toxemia cleared up rapidly, so that the patients were discharged from the hospital in from thirteen to twenty-five days, without casts or albumen in the urine or any other evidence of renal involvement. Had there been renal impairment, we consider that they would not have recovered so promptly. Moreover, in view of the normal catalytic activity of their blood

and the existing analogy between them and cases 1 and 2, which came to autopsy, we feel there is justification for believing that a renal insufficiency did not exist.

The seventh case, which also recovered, requires special consideration. Here we had to deal with a toxemia complicating the fourth pregnancy of a patient, who five years previously had been treated in this service for convulsions and coma appearing after the birth of her second child. At that time the nature of the condition was quite obscure and the diagnosis offered considerable difficulty. The third pregnancy was normal and the puerperium following it uneventful, a fact which affords strong presumptive evidence against chronic nephritis; for experience shows in women suffering with renal insufficiency that each succeeding pregnancy is prone to be complicated by a similar condition. Moreover, had there been a renal insufficiency it seems fair to assume that it would have been associated with a fall in the catalytic activity of the blood, such as is found in other cases, as well as in the following group of toxemias. The exact nature of the condition in this case is still obscure.

CASES OF TOXEMIA WITH DECREASED CATALYTIC ACTIVITY OF THE BLOOD.

(Abstracts of the clinical histories will be found at the end of the paper.)

The readings obtained were as follows:

Case No. 8	Amount of oxygen liberated in				R. B. C.	Remarks
	15 sec.	30 sec.	45 sec.	60 sec.		
11:30 A. M., November 12	9.0 c.c.	12.0 c.c.	15.0 c.c.	17.4 c.c.	3,120,000	Delivered at noon.
2 P. M., November 12	9.4 c.c.	12.6 c.c.	15.0 c.c.	17.5 c.c.	.....	Condition improved.
November 13	11.0 c.c.	14.2 c.c.	16.6 c.c.	18.4 c.c.	3,180,000	Condition improved.
November 14	10.4 c.c.	13.4 c.c.	16.0 c.c.	16.2 c.c.	.....	Condition improved.
November 16	9.6 c.c.	12.0 c.c.	14.8 c.c.	16.0 c.c.	.....	Condition improved.
November 18	10.0 c.c.	13.4 c.c.	15.0 c.c.	16.4 c.c.	3,200,000	Condition improved.
November 22	10.8 c.c.	13.8 c.c.	16.0 c.c.	18.0 c.c.	2,984,000	Patient still in bed.
December 1	10.4 c.c.	13.6 c.c.	15.8 c.c.	17.2 c.c.	.....	Three days before discharge.
Case No. 9						
December 2	9.6 c.c.	12.4 c.c.	14.6 c.c.	16.6 c.c.	3,560,000	Day before delivery.
December 17	12.8 c.c.	16.0 c.c.	18.4 c.c.	20.2 c.c.	4,000,000	Condition improved.
Case No. 10						
December 16	9.6 c.c.	13.0 c.c.	16.0 c.c.	19.0 c.c.	3,560,000	Day before delivery.
December 20	10.6 c.c.	13.6 c.c.	15.6 c.c.	18.0 c.c.	3,576,000	Improved.
January 15	12.2 c.c.	15.4 c.c.	17.8 c.c.	20.2 c.c.	4,400,000	On discharge.

These three cases (eight to ten) appear to be distinct from those in the previous group, inasmuch as they show a marked decrease in the catalytic activity of the blood. In all of them there was some increase in the phenomenon following delivery, which corresponds to the improved general condition; but each patient at the time of discharge from the hospital presented both a low activity and a persistence of the signs of nephritis.

In Case 8, the clinical history leaves it doubtful whether the patient was suffering from eclampsia or not, but the low catalytic activity of the blood indicates that there was a renal insufficiency. The persistence of albumen and casts in the urine at the time of discharge likewise favors the view that there was some permanent kidney derangement. If this were a case of true eclampsia with renal insufficiency we must bear in mind the possibility of the latter being dependent upon some injury to the kidneys produced by the etiological factor which was responsible for the eclampsia. The clinical histories in Cases 9 and 10 leave no doubt that the women were suffering from chronic nephritis.

The significance of this differentiation in the prognosis for future pregnancies is evident. In the first group future pregnancy may be normal; while in the second it will most likely be complicated by toxemia, the result of renal insufficiency.

CONCLUSIONS.

1. The determination of the catalytic activity of the blood appears to offer a means of differentiating the toxemias of pregnancy into two groups.

2. In certain instances the catalytic activity shows no departure from normal; these include cases of eclampsia and other toxemias without marked renal involvement.

3. In certain other cases the catalytic activity of the blood is decreased; these include patients suffering from chronic nephritis in whom the increased work thrown upon the kidneys by the pregnancy brings about renal insufficiency, as well as cases of true eclampsia and other toxemias with marked renal involvement.

In conclusion we wish to thank Dr. J. Whitridge Williams for his interest in this work, and for the opportunity of making our observations upon patients in the Obstetrical Department of the Johns Hopkins Hospital.

TABLE SHOWING CATALYTIC ACTIVITY OF BLOOD IN NORMAL OBSTETRICAL CASES.

Obstetric No.	Quantity of oxygen liberated in				R. B. C.	Time of observation	Puerperium	Age	Pregnancy
	15 sec.	30 sec.	45 sec.	60 sec.					
4211	14.6 c.c. 14.8 c.c. 13.8 c.c. 14.6 c.c. 10.2 c.c. 14.6 c.c. 15.8 c.c. 16.0 c.c. 15.4 c.c. 15.6 c.c. 14.6 c.c. 13.6 c.c. 14.2 c.c. 17 c.c. 18 c.c. 13.8 c.c. 13.6 c.c. 14.2 c.c. 17 c.c. 17.8 c.c. 16.6 c.c. 13.6 c.c. 14.4 c.c. 14.6 c.c.	18 c.c. 18 c.c. 16 c.c. 18.4 c.c. 19.8 c.c. 18 c.c. 18.8 c.c. 19 c.c. 18.8 c.c. 19.2 c.c. 17.8 c.c. 16.6 c.c. 17.4 c.c. 21 c.c. 22 c.c. 17 c.c. 16.8 c.c. 17.4 c.c. 21 c.c. 20.6 c.c. 18.8 c.c. 16.6 c.c. 19 c.c. 16.6 c.c. 18.2 c.c. 17.8 c.c.	20.6 c.c. 21 c.c. 19.4 c.c. 21 c.c. 22.6 c.c. 20.2 c.c. 21.8 c.c. 21.6 c.c. 21 c.c. 21.4 c.c. 20 c.c. 19.2 c.c. 20 c.c. 23.4 c.c. 25.7 c.c. 19 c.c. 18.8 c.c. 19.6 c.c. 23 c.c. 23 c.c. 22.6 c.c. 23.8 c.c. 19.2 c.c. 20.4 c.c. 20.6 c.c. 20 c.c.	23.2 c.c. 24 c.c. 21.6 c.c. 23.6 c.c. 24.8 c.c. 22.6 c.c. 24 c.c. 24 c.c. 23 c.c. 24 c.c. 22 c.c. 21 c.c. 21.8 c.c. 25.6 c.c. 27 c.c. 21 c.c. 20.6 c.c. 22 c.c. 25.8 c.c. 25 c.c. 24.8 c.c. 25.6 c.c. 26.2 c.c. 21.4 c.c. 22.8 c.c. 23 c.c. 22 c.c.	4,200,000 4,386,000 4,184,000 4,260,000 4,720,000 4,640,000 4,700,000 5,240,000 5,020,000 5,300,000 4,260,000 4,000,000 4,180,000 5,040,000 4,960,000 4,000,000 3,960,000 4,180,000 4,840,000 4,720,000 4,740,000 4,280,000 4,400,000 4,560,000 4,200,000 4,683,000 4,560,000	24 days before delivery 3 days before delivery 1 hour after delivery 12 days after delivery 10 days before delivery 1 day after delivery 10 days after delivery 3 days before delivery 10 hours after delivery 2 days after delivery 10 days before delivery 1 day after delivery 3 days after delivery In labor, first stage 21 hours after delivery 3 days before delivery 1 day after delivery 8 days after delivery 22 days before delivery 2 days before delivery 2 days after delivery 10 days before delivery 6 hours after delivery Labor, first stage 2 hours after delivery 7 hours before delivery 2 hours after delivery	Normal Normal Normal	22 18 24 16 19 21 15 30 42 18	Second First Third First Second First First Second First First Seventh First

ABSTRACTS OF CLINICAL HISTORIES.

Cases with normal catalytic activity of the blood.

CASE I.—Obstetrical, No. 4155. N. D., white, age twenty-one, o-para. Previous history negative except for headache. Admitted November 26, 1909, in labor, having convulsions. Five convulsions before operative delivery at term. On admission, blood-pressure maximum 130 mm., minimum 90 mm. of hg. (millimeters of mercury) between fourth and fifth convulsion. Urine specific gravity 1018, showed 0.75 per cent. albumen, numerous hyaline and granular casts. Following delivery patient had seventeen convulsions. Never regained consciousness and died on fourth day.

Autopsy.—Anatomical diagnosis. Peripheral necroses of liver; cloudy swelling of the viscera; acute splenic tumor; bronchopneumonia; edema of the lungs, etc. Nothing found in kidneys except the cloudy swelling. After death aqueous extracts were made of the liver, kidneys, and spleen and their power to split hydrogen peroxide was high.

CASE II.—Obstetrical, No. 4471. A. D., white, age eighteen, o-para.

Patient had edema of legs and vulva for two months and considerable abdominal pain for one month before delivery. Spontaneous delivery at term, followed by intense headache and a convulsion twenty minutes later. Admitted July 7, 1910, in coma, about three hours after delivery, having had four convulsions. On admission, blood-pressure maximum 250 mm. of hg. Urine, specific gravity, 1024, albumen, 0.8 per cent; numerous hyaline and granular casts. Severe convulsions continued at short intervals and the patient died during the seventeenth seizure seven hours later.

Autopsy.—Anatomical diagnosis. Peripheral hemorrhagic necrosis of liver; disseminated ecchymosis; acute bronchitis; edema of lungs; acute bilateral pyelitis (pregnancy); cloudy swelling of the viscera. Nothing of note found in the kidneys except the cloudy swelling above noted. After death, aqueous extracts were made of the liver and kidneys, and their power to split hydrogen peroxide was found normal.

CASE III.—Obstetrical, No. 3879. E. S., black, age thirty-two, V-para. Previous pregnancies all normal. During present pregnancy, had dimness of vision, giddy spells with slight headache, and some edema of feet and hands. Admitted in labor March 19, 1909. Operative delivery at term after having nine or ten convulsions. On admission, blood-pressure 225 mm. of hg. Urine scanty. Specific gravity 1015. Albumen 0.24 per cent. Numerous hyaline and granular casts. Patient had four convulsions following delivery. Symptoms then rapidly cleared up and she was discharged April 1, Urine free from casts and albumen.

CASE IV.—Obstetrical, No. 4173. E. S., white, age twenty-one, I-para. Previous pregnancy normal. Present pregnancy

normal except for nervousness and some headache. Spontaneous delivery at term November 8, 1909 followed in three and fifteen minutes by two typical general convulsions. Admitted about one hour later perfectly conscious. Blood-pressure maximum 170, minimum 90 mm. of hg. Urine, specific gravity 1012, albumen, 0.075 per cent. No casts. Patient had no more convulsions. Blood-pressure fell rapidly reaching normal on seventh day. Albumen disappeared from urine completely by thirteenth day, and patient was discharged December 1, 1909, without symptoms.

CASE V.—Obstetrical, No. 4214 T. J., white, age eighteen, o-para. Previous history and present pregnancy negative up to onset of convulsions. Admitted December 7, 1909, having convulsions. Four convulsions before operative delivery at nine months. On admission blood-pressure maximum 190, minimum 120 mm. of hg. between three and four convulsions. Urine scanty, specific gravity 1033, albumen 2.2 per cent., numerous and granular casts. No convulsions after delivery. Blood-pressure fell and albumen and casts disappeared from the urine gradually. Patient discharged January 1, 1910. Blood-pressure, maximum 125, minimum 75 mm. of hg. Urine containing no casts or albumen. Patient has been seen several times since discharge. Blood-pressure remains normal, urine examination is negative for casts and albumen and patient is free from symptoms.

CASE VI.—Obstetrical, No. 4272. E. H., black, age eighteen, I-para.

During puerperium of first pregnancy a small amount of albumen and a few granular casts were found in the urine once, otherwise that pregnancy was quite normal. During present pregnancy patient had some edema of feet and vulva, some headache at times, and on day of delivery complained of seeing black spots. She was admitted in labor January 19, 1910, and delivered spontaneously thirty-five minutes later at ninth month. Following delivery, urine specific gravity, 1012, albumen 0.075 per cent. No casts. During the day after delivery she complained of headache; blood pressure maximum 165, minimum 130 mm. hg. eighteen hours after delivery she had four convulsions in rapid succession. Following these she regained consciousness; blood-pressure fell rapidly, reaching normal on the seventh day; urine cleared up being free from albumen on the ninth day, no casts having been seen at any time. Discharged eighteenth day.

CASE VII.—Obstetrical, No. 3876. M. W., white, age twenty-two, IV-para.

First pregnancy, labor, and puerperium normal. Second pregnancy. Delivery at term followed by convulsions on second, fourth, sixth, and seventh days of puerperium (eighth total) with coma intervening. Admitted to Johns Hopkins Hospital November 30, 1903, on fourth day of puerperium with 1.2 per cent. albumen, hyaline and granular casts and red blood cells

in urine. Blood-pressure 176 mm. hg. No edema. Cleared up mentally by tenth day of puerperium. Blood-pressure fell to normal by thirteenth day. At time of discharge on twenty-fourth day of puerperium urine still showed a heavy cloud of albumen and a few hyaline casts.

Third pregnancy perfectly normal.

Fourth pregnancy. Patient had some headache and edema of feet during the week previous to delivery on March 14, 1909. Pregnancy otherwise normal. Delivery spontaneous at term and puerperium apparently normal up to March 17, the fourth day, when she had fifteen convulsions (five before and ten after admission) followed by coma for twenty-four hours. On admission, blood-pressure maximum 160, minimum 90 mm. of hg. Urine scanty; showed 0.3 per cent. albumen, numerous hyaline and granular casts. No edema. Patient's symptoms cleared up readily but she was discharged on April 14, 1909, with a marked cloud of albumen and granular casts in urine.

CASES WITH DECREASED CATALYTIC ACTIVITY OF THE BLOOD.

CASE I.—Obstetrical, No. 4182. J. S., white, age twenty-four, o-para.

Patient gave a very indefinite history of convulsions associated with "swelling of the body," at the age of twelve. During the last five or six months of pregnancy she had some edema and headache; after the onset of labor there was nausea, vomiting, and dimness of vision. Admitted November 12, 1909, having convulsions. Operative delivery of twins at term after having seven convulsions. On admission, blood-pressure maximum 160, minimum 100 mm. hg. Urine scanty, specific gravity 1032, albumen 1.8 per cent., many hyaline and granular casts and red blood cells. There was marked edema of face and extremities. Following delivery there were no more convulsions; recovery from coma was followed by acute mania. The edema gradually cleared up; blood-pressure fell readily, reaching 130 mm. maximum to 80 mm. minimum hg. on the seventh day. Patient discharged December 4 with a trace of albumen in the urine and an occasional granular cast.

CASE II.—Obstetrical, No. 4197. A. C., white, age thirty-three, III-para. Previous pregnancies and labors normal. Youngest child five years old. History of two abortions since birth of last child, the first three years before at six weeks, brought on by "hard work," the second about eight months previous at second month due to a "fall." Patient admitted November 26, 1909, six months pregnant, complaining of edema of face and extremities, headache, and marked dyspnea. On admission, blood pressure maximum 200, minimum 100 mm. hg. Urine showed 0.25 per cent. albumen, many hyaline and granular casts and red blood cells. There was very marked general edema of body and lungs, improvement under medicinal treatment was slight and labor was induced December 4, at sixth month of pregnancy. Following termination of pregnancy the

edema diminished under treatment, but the blood-pressure fell very slowly, and on December 22 was still 140 maximum, 85 minimum. Patient discharged December 23, 1909. She has been seen repeatedly since discharge and still has at times some edema of ankles, some headache, and the urine shows a trace of albumen. The blood-pressure is also somewhat elevated.

CASE III.—Obstetrical, No. 4225. J. H., white, age twenty-nine, o-para.

Patient had a marked albuminuria without other signs for about three months before admission. Admitted December 14, 1909, eight months pregnant, complaining of indigestion, severe general abdominal pain, and headache. An admission, blood-pressure maximum 220, minimum 130 mm. hg.; urine specific gravity 1045, albumen 3.5 per cent.; many hyaline and granular casts, moderate edema of face and extremities. After admission condition became worse; on December 17 she had a convulsion and operative delivery followed. Following this there were no further convulsions; the edema disappeared slowly; the blood-pressure remained elevated, and the pathological elements in the urine diminished very slowly. She was discharged January 15. Blood-pressure maximum 190, minimum 130 mm. hg., 0.004 per cent. albumen, and occasional casts in the urine. She has been seen repeatedly since discharge and still has both a high blood-pressure, and albumen and casts in the urine, and at times slight edema of ankles.

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ACUTE PANCREATITIS, WITH REPORT OF CASES.¹

BY

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FORTUNATELY, acute hemorrhagic pancreatitis is not a very common disease, else with our present means of early diagnosis it would be perhaps the most formidable of the acute maladies with which the surgeon is called upon to cope. To the members of this association it may not be so rare or even so formidable, for as surgeons and consultants many of the Fellows have, within the past ten or fifteen years, had occasion to become

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fairly familiar with it. But it is to the profession at large a far different matter. In the majority of cases it comes upon patients who have for years been subject to attacks of gallstone colic or attacks of indigestion or cramps and who believe that this attack is only another, perhaps a little more severe attack than usual, and it is only by the persistence of some of the more alarming symptoms, such as continuous pain, a labored respiration, rapidly increasing pulse, the appearance of tumor or uncontrollable vomiting that a surgeon is finally consulted, and then it is frequently too late.

Positive methods of diagnosis between acute pancreatitis and other diseases of the upper abdomen exist, but they are complicated and take up altogether too much time. Cambridge's pancreatic reaction of the urine or the examination of the feces for fat or pancreatic ferment are processes for the laboratory and, although of unquestioned value in the chronic or subacute forms of the disease, require too much time to help us in the more acute cases.

As the other lesions for which this disease may be mistaken, perforation of the stomach or duodenum or rupture of the gall-bladder or its ducts, all require prompt surgical attention, the earliest possible exploratory incision should be urged. Most of us are acquainted with people who have for years suffered from periodical attacks of the severest kind of pain caused by the passage of gallstones from the gall-bladder or by stones sacculated in the common duct which make a periodical effort to escape. These people steadfastly decline operation, many of them, because some one, and frequently this some one is a physician, has told them that they can be cured by olive oil, sodium phosphate, or some other nostrum. It is chiefly this class of patients that furnish all forms of pancreatic disease. Such was the history of one of my recent cases.

A male; sixty-three years of age; a brewer; a stout, robust man with a fatty abdomen. He had a history of attacks of acute epigastric pain extending over a period of ten or fifteen years. I saw him in consultation five years ago just after one of these attacks. He was then markedly jaundiced; very tender over whole upper part of abdomen; no fever. Diagnosis at that time was stone in common duct causing obstruction. Operation was advised and was under consideration for some time, but as he had a long respite from pain after that attack, operation was indefinitely postponed. He continued to have attacks,

however, more or less severe until on May 14, 1910, he was seized with one so severe as to cause an almost complete collapse. Two physicians were called who gave him temporary relief. Next day the patient began vomiting, which continued, and on the sixteenth became fecal. It was on this day, the third after the onset of the attack, that I saw him. His expression was bad, respiration labored, pulse rapid, temperature 101° . His record showed that the highest temperature the day before was 99° . There was no jaundice. His face, naturally full and florid, was decidedly livid; lips cyanotic. Abdomen, naturally large and full, was only moderately distended; pain had almost disappeared. Diagnosis: intestinal obstruction.

The patient was prepared for operation as soon as possible, but in the meantime his respiration became more labored; his temperature rose to 103° . There was no blood or fluid in the peritoneal cavity. The omental and abdominal fat was studded with numerous yellowish-brown patches of necrosis. The intestines were only moderately distended and of a reddish-brown color. The mesentery was dry, shiny, edematous, and very friable. The liver was normal, while the gall-bladder was small. The pancreas was enlarged to three or four times normal size. There was no hemorrhage in the lesser peritoneal cavity, which was drained with gauze and a large rubber tube. The pancreas was not incised, as I did not think the condition of the patient would warrant it. There was no stone in the duct as far as it could be explored, but still there may have been one, as it did not seem possible to reach the portion of the duct that was enveloped by the swollen head of the pancreas. The intestine, which was apparently paralyzed, was opened by removing the appendix, then drained of its contents and irrigated through the tube which was left in the intestine for drainage. He rallied somewhat, but his temperature continued to rise until his death, about ten hours afterward.

My second case was a very slight man, fifty-one years of age, who weighed only 118 pounds, and, though a bartender, was very temperate in his habits. He had never had gallstone or gall-bladder trouble to his knowledge, though a chronic dyspeptic. He had complained of pain in back and right side and had been confined to his house for about a week, apparently with grip. On the second day after return to his work he was taken with a sudden epigastric pain which was very severe. Next morning he noticed a swelling in the epigastrium to which he called the attention of

his physician. I saw him the same day; found a large tumor which seemed to fill the whole upper part of the abdomen, which had a rather fluctuating "feel" upon palpation. He was suffering very little or no pain; had no fever and no tympanitis nor jaundice; respiration was labored; pulse 130; urine contained considerable albumin, hyaline and granular casts.

He was removed to the hospital and operated upon the same day. There was considerable bloody serum in the general peritoneal cavity. The omentum contained a few small necrotic patches. After packing off the cavity with gauze, the gastro-hepatic omentum was opened and a mass was found to consist of a large quantity of blood only slightly clotted and a large pulpy pancreas; the blood was quickly removed and the cavity wiped as dry as possible with gauze sponges. There was very little hemorrhage at the time, so I placed in two large rubber tubes, packing them well around with gauze. I did not incise the pancreas. No stones were found, although, as in the other case, there may have been one either in the pancreatic portion of the duct or in the ampulla. The gall-bladder was small and free from stones, though the liver was large and very soft. The wound drained very freely, though I had a great deal of trouble in getting away the gauze. It was about eight weeks before the sinus was entirely closed. This patient has made a very slow recovery, and is suffering at the present time from a chronic interstitial nephritis.

Judging from this limited experience, I consider acute hemorrhagic pancreatitis an almost afebrile disease until secondary changes take place in the tissues of other organs. In my first case the fever only began after the action of the ferment had destroyed the function of the intestine and probably other organs in the abdomen. In the other case a prompt and efficient drainage prevented any serious action upon the tissues of the organs. In this case there never was more than a slight rise in temperature. My experience, then, in these two cases seems to point to two conclusions, namely, early and free incision down to the pancreas and adequate drainage.

339 MILL STREET.

CESAREAN SECTION BY THE SMALL MEDIAN INCISION ABOVE THE UMBILICUS.¹

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(With five illustrations.)

THE Cesarean operation has held and will continue to hold the attention of obstetricians. From what is known of early recorded cases from histories handed down by tradition and from present-day practices in uncivilized countries, we may properly believe that this procedure suggested itself to primitive peoples and was practised by them very early in the history of man's reproduction.

We may note, in passing, that Cazeaux, in 1842, four years before the discovery of anesthesia and more than thirty-five years before Listerism and the appearance of the Säger operation, reports in France the delivery of 164 women by Cesarean section, sixty-two of whom survived. He points to the danger, for mother and child in these cases of prolonged labor, rupture of the membranes for a considerable time, and attempts at vaginal delivery before Cesarean section is undertaken. He used the median incision, 13 to 16 cm. long below the umbilicus, and did not deliver the uterus from the abdomen.

Lusk reports Spaeth as writing, that before Säger's operation there had not been a case at the Lying-in Hospital at Vienna during this century, in which the mother had survived, and also that Baudon, writing in 1873, said: "In Paris there has not been one successful case in eighty years, although in the present century the operation has been performed on perhaps as many as fifty women."

Harris, of Philadelphia, includes the statistics of Ralford and reports for Great Britain, up to 1879, 128 cases with twenty-six recoveries; for the United States, up to 1885, 134 cases with fifty-three recoveries. He states that from April 1, 1884, to February, 1885, in this country, there were six Cesarean sections and all of the mothers and children were lost. He also reports in 1887 that since 1646 there were records of eleven women, far advanced in pregnancy, having had the abdomen and uterus ripped opened by horned cattle and that eight women

¹ Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists at Syracuse, September 20-22, 1910.

and five children survived and that formerly suturing of the uterus was not practised, and not until 1828 was it done in this country.

The same author tells us in the *American System of Obstetrics*, Hirst, published, in 1889, that Säger did his first Cesarean operation in August, 1880, accurately suturing the uterine wound with the peritoneum, edge to edge, and that he thereafter perfected his technic until it became known as "The Improved Method of Säger." It revolutionized the opinion as to the dangers of laparo-hysterotomic delivery; and among other statistics he reports eighty operations in eighteen German cities by thirty-eight operators, with only twelve maternal deaths.

The salient points of the Säger operation are: the cleansing of the abdomen and vagina with antiseptic solutions; long median incision in the lower part of the abdomen, placing two long sutures in the upper part of the wound; delivery of the uterus; the constriction of the cervix by Esmarch's elastic tube, drawing the long sutures tight and closing the abdomen above the uterus, protecting the abdominal cavity with rubber sheeting about the cervix; opening the uterus by vertical incision in the anterior wall just below the fundus to just above the cervix; emptying the uterus and closing it with three layers of interrupted sutures—one deep layer, one superficial interrupted and a Lembert suture over these.

As a worker in the Lying-in Hospital, New York, the writer would present a record of the Cesarean operations performed in that hospital. This can best be done by quoting directly that portion which refers to Cesarean section from a paper entitled, "Observations and Statistics on Sixty Thousand Labors Occurring in the Service of the Society of the Lying-in Hospital of the City of New York," by Dr. Markoe and presented by him at the International Medical Congress in Buda Pesth, September, 1909, and then, following his plan, report the cases which have occurred in the hospital from that time to date.

CESAREAN SECTION.

Cesarean section has been performed 197 times in the service of 60,000 cases, or once in 304.56 cases (0.33 per cent.). In the uncomplicated cases the results were as follows:

Number of mothers who survived	116	93.55 per cent.
Number of mothers who died.	8	6.45 per cent.
Total	124	

Number of children who survived.	112	90.32 per cent.
Number of children stillborn.	3	2.42 per cent.
Number of children dying during the puerperium.	9	7.26 per cent.
Total	124	

The causes of death in the uncomplicated cases were:

Acute dilatation of the stomach. . .	1
Ether	1
Pneumonia	4
Pulmonary embolism	1
Septicemia	1

In the complicated cases the results were as follows:

Number of mothers who survived. .	49	67.12 per cent.
Number of mothers who died. . . .	24	32.88 per cent.
Total	73	
Number of children who survived. .	50	67.57 per cent.
Number of children stillborn	11	14.86 per cent.
Number of children dying during the puerperium.	13	17.57 per cent.
Total.	74	(one case of twins.)

The causes of death in the complicated cases were:

Carcinoma, immediate hysterectomy.	1
Eclampsia.	4
Endocarditis.	1
General peritonitis (outside manipulation). . . .	6
Hysterectomy for ruptured uterus.	1
In labor three days (outside manipulation). . . .	1
Intestinal obstruction.	1
Nephritis.	1
Peritonitis.	1
Pneumonia and sepsis (outside manipulation). . .	1
Pneumonia.	2
Pott's disease.	1
Prolonged labor, second stage thirteen hours (shock).	1
Sepsis (outside manipulation).	1
Suppression of urine.	1

In the 197 cases of Cesarean section there were eight cases in which death was unavoidable, resulting from the following causes:

Acute dilatation of the stomach.....	I
Eclampsia.....	4
Ether.....	I
Pott's disease.....	I
Pulmonary embolism.....	I

In the ten moribund cases operated upon, death resulted from the following causes:

Acute dilatation of the stomach.....	I
Antepartum eclampsia.....	2
Carcinoma of the uterus.....	I
Died on table (ether).....	I
Endocarditis, postpartum hemorrhage.....	I
Lobar pneumonia (antepartum).....	I
Nephritis.....	I
Prolonged labor (forty-eight hours), failure of forceps, outside manipulation.....	I
Prolonged labor (three days), outside manipu- lation.....	I

Since Dr. Markoe's report, November, 1908, to August, 1910, Cesarean section has been performed fifty-nine times in the service of 8,200 cases, or once in 138.98 cases (0.72 per cent.).

Number of mothers who sur- vived.....	54	91.53 per cent.
Number of mothers who died....	<u>5</u>	8.47 per cent.
Total.....	59	
Number of children who sur- vived.....	51	83.60 per cent.
Number of children who died....	5	8.20 per cent.
Number of children stillborn....	5	8.20 per cent.
Total.....	61	(two cases of twins).

CAUSES OF MATERNAL DEATHS.

Toxemia of pregnancy; eclampsia; peritonitis..	I
Uterine fibroid.....	I
Puerperal sepsis.....	I
Streptococcus; cerebrospinal meningitis.....	I
Mural abscess; general peritonitis; hysterect- omy.....	<u>I</u>
Total.....	5

CAUSES OF FETAL DEATHS.

Hemophilia.....	3
Prematurity (maternal eclampsia and toxemia of pregnancy).....	1
Prematurity; atelectasis.....	1
Total.....	5

CAUSES OF STILLBIRTHS.

Twins; eclampsia; toxemia of pregnancy.....	2
Double monster (embryotomy).....	2
Labor complicated by uterine fibroid.....	1
Total.....	5

In the service of 68,200 cases at the Lying-in Hospital there were 256 Cesarean sections performed, the results of which are as follows:

Number of mothers who sur- vived.....	220	85.94 per cent.
Number of mothers who died.....	36	14.00 per cent.
Total.....	256	

Number of children who sur- vived.....	207	79.92 per cent.
Number of children who died....	33	12.74 per cent.
Number of children stillborn....	19	7.34 per cent.
Total.....	259	(three cases of twins).

Maternal mortality.....	14.06 per cent.
Fetal mortality.....	20.08 per cent.

Of the 256 Cesarean sections seventy-eight were performed by the writer.

Number of mothers who survived	65	83.33 per cent.
Number of mothers who died	13	16.67 per cent.
Total.....	78	
Number of children who survived	64	80.00 per cent.
Number of children who died	11	13.75 per cent.
Number of children stillborn.....	5	6.25 per cent.
Total.....	80.	

(Two cases of twins).

In the thirteen maternal deaths the causes were:

Prolonged labor, sepsis, shock, suppression of urine. Midwife in charge forty-eight hours. Died twenty-two hours after operation.

Prolonged labor, attempts at delivery, sepsis before admission to hospital. Died on fourth day.

Prolonged labor, outside attempt at high forceps, general streptococcemia. Died on third day.

Prolonged attempt at high forceps by private physician, general streptococcemia. Died on second day.

Shock, atonic uterus, persistent slow hemorrhage, third Cesarean operation. Died on second day.

Lobar pneumonia, moribund when Cesarean section was done. Died fourteen hours after delivery.

Acute dilatation of the stomach and anesthesia. Died thirty minutes after operation.

Septic endometritis. Died on fifty-fourth day.

Toxemia of pregnancy, eclampsia, twins nine and one-half months. Died on operating-table. Twins survived.

One case discharged on fifteenth day in good condition. Returned to hospital on twenty-ninth day with uterine and abdominal wall adherent to mural abscess. Died on tenth day after operation from general sepsis. Eclampsia; delivered at nine and one-half months. Died on second day. General streptococcemia with cerebrospinal meningitis; delivered at ninth month; moribund. Died seven hours after delivery. General sepsis with streptococcemia. Midwife in charge ninety hours before admission to hospital. Died on sixth day.

In the eleven fetal deaths the causes were:

Prolonged labor, sepsis in mother. Died on third day.

Attempts at high forceps, forceps wounds, cephalhematoma, sepsis in mother. Died fifty-three hours after birth.

Impacted face, chin posterior; prolonged labor. Died of marasmus on twenty-eighth day.

Prolonged labor, attempted high forceps by private physician. Died from streptococcemia on tenth day. Mother died from streptococcemia on second day.

One child died on fifth day; mother having died fourteen hours after operation from lobar pneumonia.

Hemophilia neonatorum. Died on fourth day.

Atelectasis; having been cured of hemophilia neonatorum. Died on fifty-fourth day.

Prematurity, eight and one-half months. Died on twenty-third day. Mother died of eclampsia on second day.

Delivered at ninth month. Died on eighteenth day. Mother died seven hours after operation from general streptococemia with cerebrospinal meningitis.

Prematurity. Died on second day.

Edema, attempted high forceps, depressed fracture, probably, of parietal bone made by promontory of sacrum. Died on tenth day (first child died on twenty-fourth day of marasmus).

In the five stillbirths the causes were: 1. Prolonged labor, attempted forceps. 2. Not viable. 3. Prolapse of cord while patient was taking anesthetic preparatory to Cesarean section. 4 and 5. Twin (two) in an eclamptic in which there was no sign of fetal life upon admission of mother (mother survived).

There were sixty-seven women operated upon, twelve of whom had repeated Cesarean section.

In ten of the cases the operation was done twice:

3767, second Cesarean section. First by another operator in another hospital. Second by author.

4830, second Cesarean section. First and second by author. Same as No. 3093.

7398, second Cesarean section. First by another operator in this hospital. No. 4729.

10128, second Cesarean section. First and second by author. Same as No. 3857.

10792, second Cesarean section. First and second by author. Same as No. 7545.

11607, second Cesarean section. First and second by author. Same as No. 8918.

14565, second Cesarean section. First by another operator in this hospital. Second by author.

17310, second Cesarean section. First and second by author. Same as No. 7391.

17780, second Cesarean section. First and second by author. Same as No. 12583.

17938, second Cesarean section. First and second by author. Same as No. 10487.

In one case the operation was done three times:

11481, third Cesarean section. The second and third by the author. Same as No. 6449. First by another operator in this hospital.

In one case the operation was done five times:

16500, fifth Cesarean section. The third, fourth and fifth by the author. Same as Nos. 5747 and 11906. First two by other operators in this hospital. Also the first delivery by the author by craniotomy, No. 20137, and she reports that she has had an abortion done.

In this number of cases there were sixty-five in which some form of pelvic contraction made the operation necessary.

For neoplasms:

One case of multiple sarcoma of pelvic and abdominal viscera.

One case of carcinoma of cervix and vagina.

One case of carcinoma of rectum and sigmoid.

One case of neoplasm of cervix.

In the seventy-eight operations there were seven cases of eclampsia.

One case of lateral placenta previa, flat pelvis, persistent bleeding, not in labor.

One case of tonic contraction of the uterus (second twin), ruptured uterus suspected but not found.

One case of lobar pneumonia, patient moribund.

One case of cerebrospinal meningitis with streptococcemia, patient moribund.

In two cases rupture of the uterus was found in patients upon whom Cesarean section had previously been done. Both of these cases had allowed themselves to go on in labor for forty-eight hours before reporting to the hospital for second Cesarean section.

Cesarean section shares with abdominal surgery in general the greatly diminished risk brought about by aseptic methods and improved technic. It has been changed from a procedure of absolutely last resort to one having a broad field of election. Women are successfully delivered now by this operation for whom it would not have been entertained as suitable a few years ago. The still relatively high maternal mortality following Cesarean section is largely chargeable to this broadened field and to the condition in which the patient is found before operation rather than to the operation itself. This is notably so in a certain number of eclamptic cases. They die regardless of how they are delivered, yet Cesarean section is the safest and quickest way to deliver them. During the past nine months the writer has performed this operation eighteen times; fifteen mothers and thirteen children survived and were discharged

from the hospital well on the following days: one on the eleventh day, seven on the twelfth day, one on the thirteenth day, one on the fifteenth day, one on the seventeenth day, one on the nineteenth day, one on the twenty-fourth day, one on the twenty-fifth day, and one remained to be operated upon for umbilical hernia which she had had for years, and was discharged well on the fifty-ninth day.

INDICATIONS FOR THE OPERATION.

There are a certain number of women in whom the disproportion between the size of the pelvic passage and the passenger who is to traverse it is so marked that it is easy to say that Cesarean section is the only thing to do. This will include all marked deformities of the pelvis caused by rickets, malacosteon; exostosis; neoplasms of the pelvis, uterus or rectum; deformities of the vagina; atresia, etc.; deformities of the uterus; cicatrices of the cervix following operation or an old laceration. And for the child, a large immoldable head with thick cranial bones, monsters, and the like.

There is a class of cases in which the Cesarean operation comes into competition with delivery by forceps, podalic version, and accouchement forcé, where it becomes a matter of judgment with the surgeon which operation shall be done. He seldom regrets electing Cesarean section; it has been our experience often to deplore having done the others. One cannot easily forget the dead and maimed children, some of the latter carrying their physical and mental deformities throughout their lives, or the mothers who are rendered permanent invalids because of injuries and lacerations which are incapable of being entirely cured. These include those pelvic deformities of less degree, certain cases of placenta previa, of tonic contraction of the uterus, some cases in which ventral fixation has been done, some eclamptic cases, moribund women where the operation is done wholly in the interest of the child, and in some cases of accidental hemorrhage.

THE MOST FAVORABLE TIME IN PREGNANCY IN WHICH TO PERFORM THE OPERATION.

In a large percentage of these cases the operation has no choice; the women are already in labor, or other conditions appear as

emergencies in women not in labor which demand immediate delivery. In those cases which are under observation before labor we believe it is wiser to wait until labor has assuredly begun, thereby taking nature's judgment that the child is mature and at full term, and then to operate without delay. Failure to wait for this time has resulted in the delivery of at least one premature infant which did not survive after careful taking of the menstrual history and examination of the fetus by several consenting consultants, one of whom was the writer. It is not necessary to wait for dilatation of the cervix. There is risk in dilating it manually. Repeatedly we have operated upon primiparous eclamptic women, not in labor nor at term, with the cervix still elongated and barely admitting the finger, whose uteri drained perfectly after the Cesarean operation without the cervix having been interfered with in any way.

PREPARATION OF THE PATIENT.

This should be done as for any other abdominal section and sterile drapings should cover the patient except the site of the operation. There should be no vaginal douche or attempts at vaginal cleansing. Examinations by vagina should be restricted. There should be assurance that the child is alive. If possible, the membranes should be intact. Following the advice of Oldshausen, twenty-five minims of ergot should be injected deeply into the muscle half an hour before the operation is to begin. This has been found to be a valuable precaution against atony of the uterus and undue hemorrhage.

THE OPERATION.

With the patient fully anesthetized and in the horizontal position on the table, the abdomen is opened by a median incision 8 to 10 cm. long from above down to the umbilicus. One or two gauze pads wet in warm salt solution are placed in the abdomen above the fundus to hold back the omentum and intestines. An assistant makes pressure with his hands outside of the abdomen against the sidewalls, rotating the uterus so that its anterior surface presents and is held well up against the abdominal opening. He continues this pressure until the uterus is emptied and at least partly closed by sutures. The uterus is then carefully opened by successive strokes of the scalpel

down to the membranes, with a median incision from just below the fundus down its anterior surface and a little longer than the abdominal opening. The hand is passed into the uterus and swept between the membranes and the uterine wall, or, if the placenta presents, it is either torn through or pushed aside. As the hand is withdrawn the anterior thigh is grasped and breech extraction is done, doing a podalic version if the breech presents below. An assistant clamps the cord in two

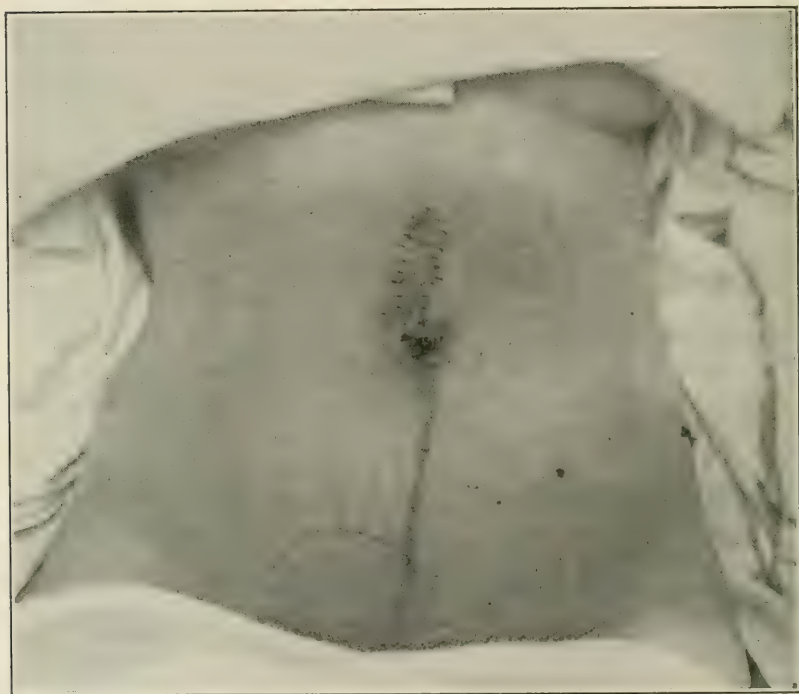


FIG. 1.—Cicatrix and outline of uterus eleven days after Cesarean section.

places, it is cut and the child preferably is taken from the room to be resuscitated.

A bullet forceps grasps the uterine wall at the upper and the lower angles of the wound. The placenta and membranes are extracted and the uterus cleared of clots. No attempt is made to dilate the cervix from above. No gauze drain is passed down through it. If the hemorrhage is at all profuse a sterile towel or gauze is quickly packed into its cavity. The uterus is then closed by six or eight deep interrupted sutures of No. 2

chromic gut, and these are buried by a continuous suture of the same material in the form of a rather deep Lembert stitch—the uterine packing being gradually withdrawn. The abdominal pads are removed; no attempt is made to cleanse the abdominal cavity, and sponging and handling the uterus is avoided as much as possible. The uterus readily assumes the size and position of that organ after normal delivery. The abdomen is closed in three layers. A small gauze dressing is applied over the abdominal wound and held in place by tight adhesive straps across the wound. An ordinary abdominal binder is

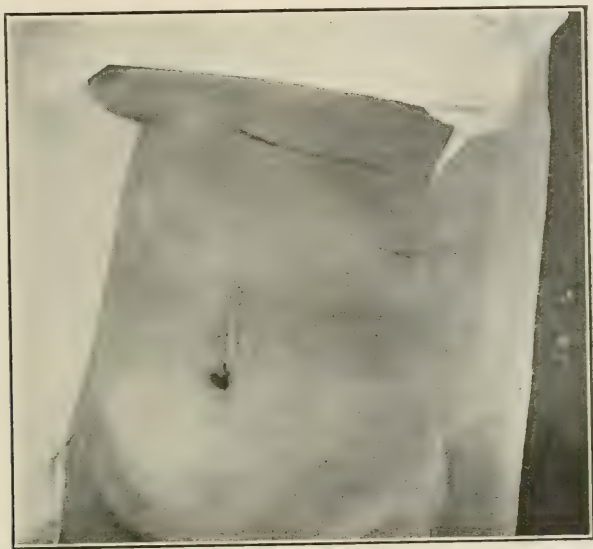


FIG. 2.—Scar after first Cesarean section.

pinned tight across the wound and loose elsewhere. By this means the uterus is allowed free play in the lower abdomen and the abdominal wall is not held tight against the uterus. The patient is placed in bed, the head of the bed is well raised to favor drainage and the decent of the uterus toward the pelvis.

In uncomplicated cases the after-treatment differs in no way from that of any laparotomy; usually, after the first forty-eight hours, in no way from that of the ordinary postpartum woman. She nurses her child, she is allowed to sit up in a chair on the eighth day and thereafter to walk about the wards, and she is discharged from the hospital on the twelfth day, postpartum. We are not unmindful of the fact that this is a

serious and dangerous operation—not more serious nor more dangerous than a number of other obstetrical procedures. We do not feel that we have the right to render these women sterile; we do the Cesarean operation repeatedly on the same woman.

Of the seventy-eight Cesarean sections performed by the writer, the first three were done in tenements; the uterus was delivered. Since August 12, 1903, he had done the operation



FIG. 3.—Shrunken and folded scar after Cesarean section. Rhaichitic dwarf.

seventy-five times and in no instance has the uterus been removed from the abdomen. Beginning with case four, a much smaller incision was used, half above and half below and to the left of the umbilicus. In the seven cases following this one, the writer gradually made the incision smaller and carried it higher up; until November 20, 1904, he, so far as he knows, first independently conceived and practised the small high median incision, entirely above the umbilicus, in a woman, the twelfth in his series (No. 4830), being the second Cesarean on this woman, same as case four (No. 2793). More than two

years after this date, the following allusion to the high incision was brought to the writer's attention in Blundell's *Midwifery*, published in 1842. He says: "Some might think, perhaps, that in removing the fetus by the Cesarean incision we ought to make the opening above the navel instead of below. To

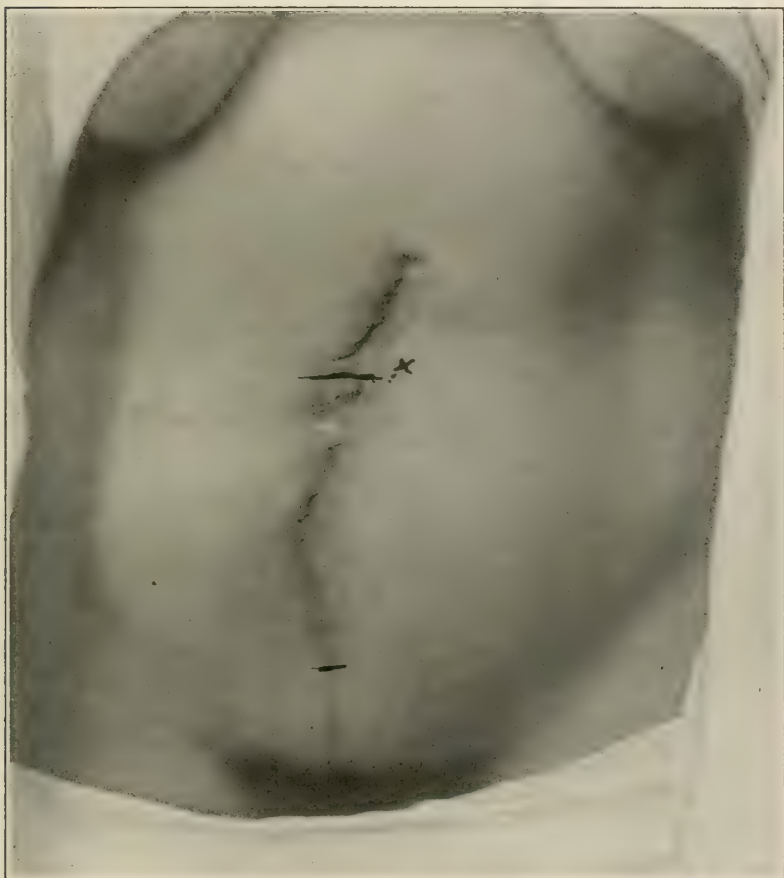


FIG. 4.—Scars after five Cesarean sections. Last three by the small high incision

this opinion, however, I can by no means accede, for if we make the incision above the navel the intestines will protrude more copiously, the region of the placenta will most probably be divided and, on the abstraction of the ovum, the womb collapsing into the pelvis will sink below our reach, disappearing beneath the intestines which fall over it. Place the incision,

therefore, below the navel; by this collocation you will avoid these impediments." Except in very recent writings, this is the only mention of the high incision above the umbilicus known to the writer.

There is no reason why this operation should be singled out from all others as one which must be performed in great haste. It should be done with the deliberation called for in any other abdominal operation. There is great danger in doing otherwise. Several times the writer has found the intestine in front of the uterus. Once he has seen it injured.

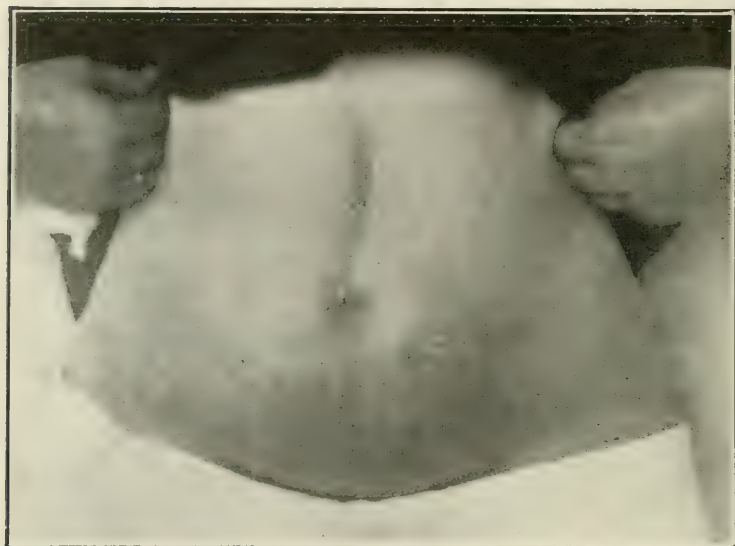


FIG. 5.—Rhachitic Dwarf showing scar after her second Cesarean section.

The incision should be long enough to allow easy delivery of the child, but the abdominal wall at this point in the full-term woman is thin and stretches easily. The small high incision does not allow easy exposure or escape of the abdominal contents. Not infrequently, all that we see is the uterus and a small portion of omentum. This wound is away from the site of greatest strain upon the abdominal wall, at a point reinforced by the recti muscles as they approach each other toward their upper attachments. It is small. We have never seen hernia following it. The liability to adhesion between the abdominal wound and the uterine wound is greatly diminished.

CESAREAN SECTION, WITH DATES, SERIAL NUMBERS, AND DETAILS OF CASES.

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
1	21259	Nov. 19, 1900	Jan. 23, 1901	Vertex L. O. A.	Rachitic dwarf.	Lived.	36th		I
2	22752	Aug. 18, 1901	Aug. 18, 1901	Vertex L. O. P.	Flattened general contracted pelvis. Bicorn. uterus.	Still-born.	43d		I
3	23369	Aug. 10, 1901	Nov. 6, 1901	Vertex	General contracted. Prolonged labor.	Died 3d day (Midwife).	22 hours.	Sepsis; suppression of urine.	I
4	2973	July 20, 1903	Aug. 12, 1903	Vertex L. O. A.	Rachitic pelvis.	Lived.	38th	First case in which I did not deliver the uterus.	I
5	3093	Sept. 15, 1903	Sept. 22, 1903	Vertex L. O. A.	Funnel pelvis.	Lived.	34th		I
6	3168	Sept. 17, 1903	Oct. 13, 1903	Vertex L. O. A.	Anchylolysis right hip, Naegele pelvis.	Lived.	58th		I
7	3228	Oct. 24, 1903	Nov. 23, 1903		Marked lordosis.	Not viable.	39th	General sarcomatosis; pregnant 7th mo. Sarcoma of pelvic and abdominal organs; anasarca. Died at home, 76th day.	I
8	3383	Nov. 21, 1903	Dec. 18, 1903	Vertex L. O. A.	Rachitic dwarf.	Lived.	52d		I
9	3684	Feb. 26, 1904	Feb. 26, 1904	Vertex R. O. A.	Rachitic, oblique.	Lived.	26th		I
10	3766	Mar. 18, 1904	Mar. 18, 1904	Vertex R. O. A.	General contracted pelvis.	Lived.	19th; 4th died.	Sepsis; prolonged labor; attempted delay before administration. Second Cesarean section.	II
11	3857	Apr. 4, 1904	Apr. 11, 1904	Vertex	Rachitic pelvis.	Lived.	30th		III
12	4830	Oct. 19, 1904	Nov. 20, 1904	Vertex L. O. A.	Rachitic pelvis. Same as No. 4 (2973).	Lived.	29th	First case with medial incision wholly above umbilicus.	II
13	4867	Nov. 29, 1904	Nov. 29, 1904	Vertex R. O. A.	Naegele pelvis; right side.	Lived.	19th	Scar 7 cm. long. Sitting up on 14th day.	I
14	5079	Jan. 17, 1905	Jan. 17, 1905	Vertex L. O. A.	Flat pelvis. Long labor. Forceps attempt. by outside doctors.	Died in 53 hours.	3d died.	General peritonitis; gangr. endometritis; general streptococemia and Staphylococemia.	I
15	5249	Feb. 2, 1905	Feb. 20, 1905	Vertex L. O. A.		Marasmus.	41st		I
16	5747	May 27, 1905	June 7, 1905	Breech L. S. A.	Double promontory. Rachitic pelvis.	Died 25th day Lived.	18th	Before this other operators did craniotomy and two Cesareans.	IV
17	5880	July 23, 1905	July 23, 1905	Vertex	Carcinoma cervix and vagina	Lived.	29th		II
18	6260	July 8, 1905	Sept. 11, 1905	Vertex L. O. A.	Flat pelvis.	Lived.	29th		I
19	6449	Sept. 28, 1905	Oct. 18, 1905	Vertex R. O. A.	General contracted.	Lived.	18th	C. S. 6/21/04. Other operator.	II

CESAREAN SECTION WITH DATES, SERIAL NUMBERS, AND DETAILS OF CASES. (Continued.)

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
20	7194	Mar. 11, 1906	Mar. 12, 1906	Vertex L. O. A.	Flat figure 8 pelvis.	Lived.	16th		I
21	7276	Mar. 27, 1906	Mar. 27, 1906	Face R. M. P.	Oblique contracted pelvis. Impacted Face. Tonic uterine contraction.	Marasmus. Died 28th.	36th	Ceph. and podalic versions failed.	I
22	7391	Apr. 13, 1906	Apr. 14, 1906	Vertex L. O. A.	Rachitic dwarf.	Lived.	25th		I
23	7398	Apr. 16, 1906	Apr. 16, 1906	Vertex L. O. A.	Contracted pelvis.	Lived.	23d	C. S., Oct. 27, 1904. Other operator.	IV
24	7545	May 10, 1906	May 10, 1906	Vertex L. O. A.	Flat pelvis.	Lived.	38th		I
25	8727	Nov. 25, 1906	Nov. 25, 1906	Vertex R. O.	Transverse. General contracted pelvis.	Lived.	15th		II
26	8931	Dec. 25, 1906	Dec. 26, 1906	Vertex L. O. A. Twins.	First child delivered in O. P. D. 38124. Tonic uterine contracture.	Died.	31st	Version and high forceps attempted. Admitted as ruptured uterus.	IV
27	8118	Dec. 23, 1906	Dec. 23, 1906	Vertex L. O. A.	Flat general contracture.	Lived.	18th		II
28	9189	Feb. 1, 1907	Feb. 1, 1907	Vertex R. O. P.	High forceps attempted; presented dorsal. Flat pelvis. Long labor.	Died 10th.	2d	General Streptococemia both in mother and child.	I
29	10100	Apr. 29, 1907	June 16, 1907	Vertex L. O. A.	Second Cesarean. Same as No. 65. Rachitic pelvis.	Lived.	22d		I
30	10128	May 12, 1907	June 19, 1907	Breech L. S. A.	Rachitic pelvis; Long spines.	Lived.	18th	First Cesarean, No. 11 (3857).	IV
31	10187	Aug. 4, 1907	Aug. 5, 1907	Vertex L. O. A.	Flat justo minor.	Lived.	34th		II
32	10119	Aug. 6, 1907	Aug. 6, 1907	Vertex R. O. A.	Flat justo minor.	Lived.	20th		I
33	10712	Sept. 10, 1907	Sept. 10, 1907	Vertex L. O. A.	Flat rachitic pelvis.	Lived.	17th	First C. S. Same as No. 24 (7545).	II
34	10968	July 19, 1907	Oct. 7, 1907	Vertex R. O. A.	Rachitic dwarf.	Still-birth.	27th	Prolapsed cord while taking ether for Cesarean section.	I
35	11000	Oct. 13, 1907	Oct. 13, 1907	Vertex R. O. A.	Double promontory. Lat. contracted pelvis.	Lived.	15th		III
36	11157	Nov. 7, 1907	Nov. 8, 1907	Vertex R. O. A.	Flat pelvis.	Lived.	29th		II
37	11169	Nov. 10, 1907	Nov. 10, 1907	Vertex L. O. A.	Eclampsia, 9 1/2 months.	Lived.	17th		I
38	11258	Nov. 22, 1907	Nov. 23, 1907	Vertex	General contracted pelvis.	Lived.	16th		II
39	11481	Dec. 25, 1909	Dec. 26, 1907	Vertex L. O. A.	General contracted pelvis.	Lived.	2d died.	First child died 6th day p. p. high forceps.	III
40	11607	Jan. 9, 1908	Jan. 9, 1908	Vertex.	Ruptured uterus. Same as No. 27 (8918) 2d C. S.	Lived.	24th	Shock; Hemorrhage, 3d C.S. Delayed reporting until long in labor. Resection of tubes.	III
41	11823	Feb. 5, 1908	Feb. 5, 1908	Vertex.	Impacted in pelvis. Fibroids of uterus.	Lived.	19th		IV
42	11906	Feb. 16, 1908	Feb. 16, 1908	Breech.	Fourth Cesarean. Eclampsia.	Lived.	20th	Same as No. 16 (5747).	VI
43	12148	Mar. 17, 1908	Mar. 17, 1908	Vertex.	Not in labor. Full term. Justo minor.	Lived.	61st	Homeless.	I

CESAREAN SECTION, WITH DATES, SERIAL NUMBERS, AND DETAILS OF CASES. (Continued.)

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
44	12243	Mar. 27, 1908	Mar. 27, 1908	Vertex.	Lobar pneumonia. Moribund.	Died 5th.	.....	Died 14 hours after operation.	VI
45	12249	Mar. 31, 1908	Mar. 31, 1908	Breech L. S. A.	Acquired dilatation of stomach. Naegele pelvis.	Lived.		Anesthesia taken badly. Died 30 minutes after operation.	II
46	12453	Apr. 29, 1908	Apr. 29, 1908	Vertex L. O. A.	Flat pelvis.	Lived.		Died 54th day. Septic endometritis.	II
47	12482	May 1, 1908	May 2, 1908	Breech.	Generally contracted.	Lived.	14th	Died on table not in labor.	I
48	12483	Apr. 21, 1908	May 2, 1908	Twins, both vertex.	Toxemia.	Both lived.			I
49	12531	May 8, 1908	May 8, 1908	Vertex L. O. A.	Justo minor flat.	Lived.	26th	Inspiration pneumonia.	I
50	12583	May 15, 1908	May 15, 1908	Face R. M. A.	Flat pelvis.	Lived.	16th		I
51	12661	May 27, 1908	May 28, 1908	Breech L. S. A.	Nine and a half months. A. P. Eclampsia.	Lived.	31st		I
52	12938	June 28, 1908	June 28, 1908	Vertex L. O.	Transverse flat, generally contracted.	Lived.	13th		IV
53	14178	Dec. 9, 1908	Dec. 9, 1908	Vertex L. O. A.	Transverse, flat generally contracted. Attempted high forceps.	Lived.	24th		VIII
54	14565	Jan. 29, 1909	Jan. 30, 1909	Vertex L. O. A.	Justo minor pelvis.	Lived.	15th died.	Returned to hospital 29th day, mural abscess, operation. Died 39th day.	III
55	14637	Feb. 10, 1909	Feb. 10, 1909	Vertex R. O. A.	Carcinoma rectum and sigmoid.	Lived.	14th		VIII
56	14731	Feb. 11, 1909	Feb. 20, 1909	Vertex L. O. A.	Flat rachitic pelvis.	Lived.	14th	Hemophilia neonatorum.	I
57	15479	May 19, 1909	June 6, 1909	Vertex.	Neoplasm of cervix.	Died 4th day.	16th		III
58	15575	June 12, 1909	June 19, 1909	Vertex R. O. A.	Flat pelvis. Vent. fix.	Lived.	20th		V
59	16500	Oct. 31, 1909	Oct. 31, 1909	Vertex L. O. A.	Fifth Cesarean.	Lived.	16th	Same as No. 16 (5747).	VII
60	16558	Nov. 4, 1909	Nov. 12, 1909	Vertex R. O. A.	Flat pelvis. Placenta previa margin.	Lived.	43d	No in labor; persistent bleeding.	I
61	16890	Jan. 4, 1910	Jan. 4, 1910	Vertex L. O. A.	Generally contracted.	Lived.	12th		I
62	16961	Jan. 12, 1910	Jan. 15, 1910	Vertex R. O. A.	Exostosis back of symph.	Lived.	12th		I
63	16977	Jan. 17, 1910	Jan. 17, 1910	Vertex L. O. A.	Lateral contracted pelvis.	Child died 54th day.	59th	Operation 25th day to cure old umbil. hernia.	III
64	17107	Feb. 4, 1910	Feb. 5, 1910	Vertex L. O. A.	Not in labor. Eclampsia, 8 1/2 months.	Atelectasis. Died 23d.	Died 2d.		I
65	17113	Feb. 6, 1910	Feb. 6, 1910	Vertex L. O. A.	Rachitic pelvis.	Lived.	12th	Second C. S. Same as No. 29 (10100).	II

CESAREAN SECTION, WITH DATES, SERIAL NUMBERS, AND DETAILS OF CASES. (Continued.)

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
66	17128	Nov. 6, 1909	Feb. 10, 1910	Vertex L. O. A.	In labor 48 hours. Small rachitic pelvis.	Lived.	25th	Becoming exhausted, p. 120.	I
67	17214	Feb. 19, 1910	Feb. 23, 1910	Vertex R. O. A.	Ninth months. Not in labor. Justo minor pelvis.	Died 18th.	Died 7 hours.	Streptococemia; cerebro-spinal meningitis.	I
68	17310	Feb. 26, 1910	Mar. 10, 1910	Vertex R. O. A.	Rachitic dwarf. Second C. S.	Lived.	12th	Same as No. 22 (7391).	II
69	17493	Mar. 31, 1910	Apr. 5, 1910	Vertex R. O. A.	Rachitic contracted pelvis.	Lived.	12th	First child craniotomy.	II
70	17514	Apr. 9, 1910	Apr. 9, 1910	Vertex L. O. A.	Rigid cervix; living child. Eclampsia. Not in labor.	Lived.	24th		I
71	17562	Apr. 18, 1910	Apr. 18, 1910	Vertex R. O. A.	Flat pelvis. Second C. S.	Lived.	12th	Same as No. 35 (11000).	II
72	17603	Apr. 26, 1910	Apr. 26, 1910	Both vertex; twin	Eclampsia. No sign of fetal life. Twins.	Still-births.	19th		I
73	17702	May 16, 1910	May 16, 1910	Vertex L. O. A.	Contracted pelvis.	Lived.	11th	Rupture of uterus through old Cesarean scar.	II
74	17780	June 1, 1910	June 1, 1910	Vertex R. O. A.	Contracted inlet. Exostosis. Same as No. 50 (12583).	Lived.	17th	Cesarean.	VIII
75	17856	June 20, 1910	June 20, 1910	Vertex R. O. A.	Rachitic dwarf.	Lived.	13th		II
76	17938	Mar. 14, 1910	July 11, 1910	Breech.	Rachitic pelvis, 2d C. S. Same as No. 31 (10487).	Lived.	15th		III
77	18101	Aug. 17, 1910	Aug. 18, 1910	Vertex L. O. A.	Long labor, 90 hours, rachitic flat pelvis.	Lived.	6th	Mid wife. Septicemia. (Staphylococemia.)	I
78	18109	Aug. 18, 1910	Aug. 18, 1910	Vertex R. O. A.	Contracted pelvis. Atresia of vagina.	Died 2d day.	12th	Hydramnios. In labor 10 hours. Child premature.	I

ADENOCARCINOMA OF THE KIDNEY.¹

BY

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(With seven illustrations.)

IN the earlier reports upon tumors of the kidney the writers are not at all clear in their nomenclature and it is evident that considerable confusion existed in their minds as to the character and origin of these growths. The term cancer then included sarcoma as well as carcinoma. We also find in use the terms scirrhus, encephaloid, colloid, and the like, with but little reference to the histogenesis of the tumor structure. Even at present, with our increasing knowledge of pathology, difficulty is found in properly classifying some of these growths, owing to their cellular structure partaking strongly of the nature of carcinoma in one portion, while in close proximity will be found a structure quite similar to sarcoma. There is also a class of tumors in which the cellular elements are of such great variety that the growth cannot be properly placed in any of the usual groups, hence the term "mixed tumors" has been placed to this class. Under this head may be placed embryonal adenomyochondrosarcoma, teratomata, and the like.

Adami(1) says that while pure adenomas showing no tendency to reversion are found in the kidney in common with ovary and testes that in this organ are met a remarkable series of transitional tumors. Tumors in certain areas are definitely of adenomatous type, in others formed of solid cell masses which are not truly adenomatous because, on employing Mallory's stain, we find that here and there connective-tissue fibers are present between the cells. These portions are of the nature of alveolar sarcoma and, on careful study, we can make out the transition from the truly adenomatous to the alveolar sarcomatous areas. And from these latter areas we may pass to regions of purely sarcomatous type, round, or even blunt spindle celled. The picture is an extraordinary one, wholly at variance with the older views of the sanctity of sarcomatous and carcinomatous prop-

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erties. Here absolutely without any manner of doubt a tumor shows transition from carcinomatous to sarcomatous characteristics. The condition has been regarded as inexplicable, has been labeled carcinoma sarcomatodes or sarcoma carcinomatodes, has been treated as ne'er-do-weel member of the family, and too often left out of account in general discussions upon the family relationships of neoplasms. Some have thought to dismiss these cases by ruling that the mesoblast cannot form true gland tissue and true adenomas or carcinomas; that wherever, as in the kidney, we obtain typical gland tubules these must be of epiblastic or hypoblastic origin; others have denied the transition, but the fact is that such transition occurs and is to be found in tumors of just these organs as, again, in the endothelioma.

The great variety shown by renal growths renders proper classification rather complicated; the histological division will serve our purpose.

1. Those derived from the mesoblast: lipoma, fibroma, enchondroma, osteoma (?), angioma, lymphangioma, sarcoma, angiosarcoma, endothelioma, perithelioma, or perivascular angiosarcoma, and combinations of these types.

2. Those of epiblastic origin: adenoma, cystoadenoma, adenocarcinoma, and carcinoma, including epithelioma.

3. Hypernephroma.

4. Mixed tumors: embryonal adenosarcoma, teratoma.

It is not the purpose of the writer to enter into a discussion of histological characteristics of the different groups of these growths. Since Grawitz described in 1883 tumor *adrenalis aberrantes* or hypernephroma that type of tumor has received a large amount of attention from the profession. The members of this Association are quite familiar with its literature. I have found, however, perhaps from its rarity, that adenocarcinoma has but rarely been mentioned.

Rokitansky(2) says "Carcinomatous growths occur frequently in the kidneys and in the primary form. This is particularly the case with medullary cancer which we find attaining large size, whereas alveolar and hyaline cancer are extremely rare." Marc d'Espine,(3) during thirteen years, found two fatal cases of cancer of the kidney among 889 deaths from cancer, or 0.3 per cent. Willigk(4) found from postmortem 4.6 per cent. of carcinoma to be renal, secondary cancers, of course, being included.

Virchow(5) gives five-tenths of 1 per cent. as the proportion of malignant neoplasms which affect the kidney in the cases

occurring in Wurtzburg during four years. Three cases of cancer of the kidney were registered in ten years in Virchow's Clinic at the Charité Hospital, at Berlin.

Steiner(6) found four cases in 100,000 children in the Children's Hospital at Prague.

Kelynack(7) has carefully searched the *Pathological Record* of the Manchester Royal Infirmary and found nine cases or 0.19 per cent. of death from various causes. He thinks 2 to 3 per cent. a fair proportion of malignant growths of the kidney to malignant disease of all other parts. He collected 306 cases of renal tumors from all sources divided as follows:

Sarcomata,	115
Myosarcomata,	22
Fibromata or lipomata,	15
Adenomata,	12
Carcinomata,	142

making a proportion of 46.4 per cent. carcinomata, the exact variety not being given. He frankly states that table is not accurate.

D. M'K. Dewar(8) reports a case of adenocarcinoma of the kidney undergoing colloid degeneration. Male, forty-two years. Two weeks prior to admission had blood in his urine, at first profuse but became quite clear in four days. At no other time had he noticed any abnormality in his urine nor had he ever suffered any pain or uneasiness of any kind. Was always in good health and gave nothing of note in his family history. Examination revealed a large hard swelling in the right renal region about the size of an ostrich egg with a nodular surface, three distinct bosses being felt. The renal mass moved with respiration and could be pushed backward and also inward. There was neither pain nor tenderness on pressure, nor did any movement or position produce any dragging sensation or, in fact, any inconvenience. The heart and other organs were absolutely normal; urine slightly acid, specific gravity 1020, no albumin, sugar or blood.

On lumbar nephrectomy the growth was found to extend along the course of the ureter and that tube was ligatured at a level of 2 inches below the site of the ligature of the renal vessels. The operation was entirely extraperitoneal and a drainage-tube was inserted. By the end of the first day 13 ounces of urine were drawn off and the patient next day passed

32 ounces without inconvenience. The daily average until he left the hospital was 45 ounces. Recovery in nine weeks. At no time was any abnormality found in the urine while in the hospital. On section the kidney presented its normal appearance in the upper third and in its lower extremity for about 2 inches square; the rest of the organ was replaced by a firm nodulated growth of a dirty whitish-yellow color. The microscope showed an adenocarcinoma undergoing colloid degeneration.

This writer states that while cancer of the kidney is by no means rare colloid degeneration is very uncommon, only one specimen being found in the Museum of the Royal Infirmary and it was obtained postmortem over thirty years before. Dr. Newman, in discussing this report states that only five cases of colloid degeneration of renal tumor have been recorded by Rokitsansky, Gluge, Dickerson, Schuppell, and a fifth by Newman in his "Surgical Diseases of the Kidney."

D. Newman(9) reports case of rapidly growing alveolar carcinoma of the right kidney with beginning colloid degeneration. Male, fifty-three years. Admitted December 11, 1902. In January previously was operated upon for right inguinal hernia. In the following March began to suffer pain in both loins, chiefly in the right; also pain in the region of the bladder, but this was occasional, not constant as the renal pain appeared to be. A few days after the onset of pain the urine was noticed to be darkly tinged with blood and a number of clots were passed. This ceased in a few days. Some relief followed, but the pain in the loins never entirely ceased. Intermittent hematuria, intervals becoming shorter—the hemorrhage occurred every four or five days and it was least when the patient was recumbent. Examination showed tenderness in the inner portion of both hypochondriac regions. Right kidney appeared somewhat increased in size, not to a marked degree, mobile, and painful on pressure. The left appeared to be normal in size. Urine clear, specific gravity 1010, a trace of albumin, no blood nor other abnormal ingredient. On the day following the urine was deeply stained with blood and considerable difficulty was encountered in clearing the bladder for cystoscopy. Upon second examination two days later blood was seen to come from the right ureter. Ureteral orifices healthy.

Lumbar nephrectomy January 7, 1903. Growth limited to the parenchyma of the kidney. Immediately after the operation the hematuria ceased. Patient made a satisfactory

recovery. The quantities of urine for each twenty-four hours after the operation was as follows during the first six days: 22, 28, 45, 44, 73, and 105 ounces, and after that it varied from 70 to 90 ounces. The excised kidney was occupied by a tumor the size of a small orange. This protruded from the outer side of the organ and involved the parenchyma only. The pelvis and ureters were free. On section, the growth was extremely soft, almost pultaceous, but on hardening, when complete section was made, the tumor proper was found to be increased in bulk by numerous hemorrhages into its substance. The growth was composed of large alveoli lined by irregular large-celled multinucleated epithelium, and this was arranged sometimes in single rows; at other parts the cells were three or four deep, while the center of the space was occupied by clear, colorless material. The septa of the alveoli were composed of very delicate strands of fibrous tissue and in many parts several alveoli had coalesced to form larger cavities. Many of these larger cavities were filled with blood-corpuscles. The patient was reported well one year afterward.

H. Denzinger(10) described a case of adenocarcinoma of the kidney in a man sixty years of age. For two years had suffered with anorexia, nausea, and occasional chills followed by general severe disturbances, localized pain in the left lumbar region and the lateral portion of the bladder. Had bloody urine off and on for years, but lately passed quite a quantity of blood, at one time about 3 liters. A tumor of the left kidney was palpated; an attack of erysipelas complicated his condition. Death followed from a general breakdown. On autopsy the left kidney was found enormously enlarged, one and one-half times as large as a child's head, by a tumor consisting of fatty, solid, and partly necrotic tissue, with hemorrhagic infarcts distributed throughout the mass. Both poles showed well-preserved kidney substance. At one pole there were a number of calculi and one large incarcerated stone. The tumor consisted of single nodular masses separated from each other by connective tissue. The nodules were of grayish-red color, others dirty yellow, some flesh, others necrotic and hemorrhagic. Microscopical examination showed the growth to be an adenocarcinoma.

Krönlein(11) reports a case of nephrectomy for adenocarcinoma which patient was perfectly well eighteen years and seven months after the operation. The case was that of a female, fifty-

eight years, single, diagnosticated as adenocarcinoma of the right kidney. Paraperitoneal nephrectomy was performed April 11, 1885; discharged cured May 9, 1885. The tumor had given rise to symptoms for about one year, pointing to kidney trouble. On account of the size of the tumor, about four times the normal dimensions of the organ, the operator for the first time chose the so-called paraperitoneal flank incision, as described by himself, d'Antona, and Trelat. The capsule of the kidney was nowhere broken through by the soft, hemorrhagic cancerous mass, but otherwise the entire kidney substance was involved with the exception of a small portion at the lower pole; the ureter up to about 1 cm. from the cut surface was completely filled with tumor masses, but the vessels of the hilus were free. The diagnosis of adenocarcinoma was confirmed by the microscope. The patient is now seventy-six years old, is in good health, has had nothing to indicate recurrence and has had no hernia from the cicatrix, although the abdominal wall is very flabby. She had always worn a broad, well-fitting binder since the operation.

This case seems to be the only one reported in the literature in which the patient was free from recurrence for such a long time after nephrectomy for malignant disease, the next in point of time being a case reported by Israel which patient was well fourteen years after.

C. Weigert(12) reports a unique case of congenital adenocarcinoma of the kidney occurring in a still-born full-term child. Although poorly developed the internal organs were fairly normal, but testicles had not descended and it had harelip and cleft palate. The left kidney was the seat of numerous nodules, from the size of a pea to a hazelnut, but the parenchyma was of normal structure. The nodules proved to be typical adenocarcinoma. The right kidney was much smaller and also contained one small nodule, size of a cherry, otherwise normal. He also mentions a case which occurred at the age of one month (Bednar, *Canstatt's Jahresber*, 1873, i, 218).

T. Baumgarten(13) reports a case of congenital adenocarcinoma of the kidney occurring in the case of a girl, seven years, from whom they removed a tumor which upon histological examination they pronounced to be an embryonal adenocarcinoma. The child remained in good health until 1901, seven and one-half years later, when she was again admitted to hospital with a tumor occupying the entire left side of abdomen with general

breakdown of constitution and every evidence of recurrence of the primary disease. Laparotomy was performed Feb. 23, 1901, and showed a tumor situated in the lateral posterior abdomen, enclosed in a capsule with numerous firm adhesions to the intestines, making extirpation difficult and necessitating resection of a large portion of the transverse colon. Beneath the tumor proper, in the anterior abdominal cavity there was another highly vascular nodule, completely separated from the former, which was also removed. Inspection and palpation of the liver during the operation showed the presence of many metastatic nodules in the liver, especially prominent on the convex surface. The spleen was enlarged and hard, the right kidney as well as the internal genital organs were not changed. The extirpated tumor, mostly solid-soft, partly cystic, weighed 3500 gm., its length was 64 cm., its breadth 51 cm. The patient recovered from the operation and lived until the following September, when she died at her home, very likely from metastasis. Histological examination of the mass proved it to be the same structure as the original—adenocarcinoma.

Some of these tumors attain to very large size, as in the last recorded. The largest reported weighed 35 pounds (*Twentieth Century Practice*, vol. xvii, p. 549). Most authorities state that the right kidney is affected more frequently than the left, although some claim the reverse is true.

H. Brooks(14) reports the case of a woman, forty-eight years, who died of an injury. He discovered at autopsy a tumor consisting of a globular mass, smooth, subcapsular and of less tension than the remaining portion of the kidney tissue. It proved to be an adenocarcinoma, which he considered as originally an adenoma with subsequent malignant change. He collected 127 cases up to 1896, but among them were some congenital tumors and others in which the description is more characteristic of the more common growth, hypernephroma.

Shrady reported a case in 1881. Fenger(15) reports a case of primary carcinoma of the left kidney. He states that the average duration of the disease in adults is one to two years. One of Wagner's cases lasted seven and one-half years. Brewer(16) reports a primary tubular carcinoma of the left kidney. Exploratory puncture resulted in so much hemorrhage that immediate interference was necessary.

Relative Frequency.—The frequency with which different tumors of the kidney are met cannot be determined with accuracy,

owing to the confusion of terms employed by different writers upon this subject. A. B. Johnson(17) mentions twenty cases of renal tumor occurring in the Roosevelt Hospital from 1890 to 1900 and the New York Hospital from 1900 to 1908 in children and adults, as follows:

In children:

Round-celled sarcoma.....	1
Mixed tumor—embryonal adenomyochondro-sarcoma	2
Mixed tumor, probably involving both halves of a horseshoe kidney.....	1
Mixed-celled sarcoma	1

In fourteen adults there were:

Carcinoma.....	4
Cystic sarcoma	1
Adenosarcoma	3
Sarcoma	3
Hypernephroma.....	3
Unknown character.....	1

Morris(18) gives the relative frequency of 154 renal growths as follows:

Sarcomata.....	63
Carcinomata	41
Cystic degeneration	21
Hydatid cysts	11
Adenomata	10
Papillomata	3
Myxomata	2
Lipomata	2
Dermoid cyst	1

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Primary malignant disease of the kidney is usually unilateral. The left side shows a slight preponderance, while both kidneys are affected in a very small percentage of cases, although Morris states that the right kidney is affected very much more frequently than the left and gives figures from English and American authors in support of the view.

Kelynack gives:

- 44.07 per cent. affecting the right kidney.
- 45.76 per cent. affecting the left kidney.
- 10.18 per cent. affecting both kidneys.

Extension of Growth.—1. The spread of malignant disease of the kidney may occur by direct invasion into the venous channels.

2. By extension into contiguous tissue.

3. Through the lymphatic vessels, the lumbar, mesenteric, and vertebral glands being first invaded.

4. Invasion of the bladder may occur through the urinary stream.

Kelynack says that spread by lymphatic invasion does not generally occur early, and as far as he can gather is comparatively rare. Metastatic deposits occur in the lumbar, mesenteric, and vertebral glands, liver, bones, suprarenal capsules, omentum, heart, and the like.

Duration.—The duration ranges from six months to six years.

Age.—The age at which carcinoma of the kidney most frequently appears is between forty and sixty, although some cases are seen under thirty, and we have just mentioned two cases of congenital adenocarcinoma, one occurring in fetal life and the other in a young infant.

Sex.—Reported cases seem to show that males suffer almost twice as often as females from malignant tumor of the kidney. According to J. Israel, (19) of sixty-eight cases forty-five were males and twenty-three females.

Heredity.—All authorities seem to be agreed upon the statement that heredity is of little importance in the development of these growths.

Causation.—We have no positive knowledge of the causative factors in the production of renal growths. It is quite probable that a large proportion are of congenital origin and in part at least due to cell rests, as congenital cystic kidney, congenital sarcoma, hypernephroma, and similar conditions. In some cases it would seem likely that the aberrant cells remain quiescent to be excited into activity in life by trauma or irritation.

Chomel, Bright, Manzolini, W. Brinton, Jerzykowsky (20) each report a case of injury subsequently followed by carcinoma of the kidney. However, the kidney is so well protected that traumatism and irritation, which have been considered by some as important in the production of newgrowths in other localities,

would be thought unimportant factors in the production of renal neoplasms. The number of cases in which the first symptoms noted appear after an injury make us pause and question whether traumatism is the cause of tumor formation. It is possible that the injury simply calls attention to a preexisting growth or, again, it may excite into activity and mitosis cells already possessing abnormal power of reproduction or it may be simply a coincidence.

Is Calculus a Causative Factor?—As a result of chronic irritation in other parts of the body carcinomatous growths have been known to develop (*Morris*, vol. i, p. 548). Gallstones have been considered by many to be a causative factor in carcinoma of the gall-bladder. Wilks, Frerichs, and other well-known pathologists have regarded calculus as a causal agent in some cases of carcinoma of the kidney. Cases have been reported by Bright, (21) Eves, Brodeur, Walsham, MacCormac, Morris, Battle, Knowsley Thornton, and Drew. According to Drew, specimens of papillomata associated with calculus formation are to be found in the Museums of University College and Guys Hospital. Butlin says, "The frequency with which renal calculus has been found in cases of renal cancer has led to the belief that cancer is induced by the presence of calculus."

A number of other cases where calculi and growth were associated have been recorded by Coupland, Cullingworth, Davy, Dickinson, Gluge, Hartmann, Israel, Jessop, Lucas, Moore, Papavoine, Pollard, Rokitsansky and Schuppel. The exact character of the carcinoma in these cases is not given and I have been able to find only one case of adenocarcinoma coupled with calculus. I think from the evidence at hand we are justified in the conclusion that the presence of calculus may favor the development of the growth, but that it is a direct cause is certainly not proven.

Diagnosis.—The diagnosis of renal tumors is by no means easy at the time at which surgical intervention offers some hope to the patient of a permanent cure. The symptoms which will attract the patient's attention to his condition are hematuria of an intermittent type occurring in some instances after an injury, but recurring without apparent cause. The blood is usually mixed well with the urine, but in some instances clots are noted. The quantity of blood varies markedly, is more persistent in carcinoma than sarcoma, and also in adults more than in children.

According to Imbert(22) hematuria as a sign of renal neoplasm

is more frequent in the adult and very exceptional in the child. He states that Guyon has found it as an early symptom 137 times in 257 observations, or 54 per cent., but it must not be regarded as a sign of beginning disease of the kidney for, on the contrary, it is usually a late symptom according to the latter author's experience. He collected 357 cases in which the diagnosis had already been established. Of these 235, or 68 per cent., had bloody urine, and says it is most often seen in epithelioma and hypernephroma 75 per cent., while in adenoma and sarcoma it was present 45 per cent.

Enlargement of the kidney is the next sign of importance. Perceptible increase in the size of this gland was present in 255 cases out of 303, or 84 per cent. By placing the patient on the unaffected side Israel has been able to demonstrate small neoplasms the size of a hazelnut to that of a plum.

Pain.—Often pain is not an important symptom and in some cases it appears as a dull, heavy, dragging sensation in the loin and side. In my own cases the pain was never very severe—According to Johnson, "In the cases which do not bleed, pain consisted more in a feeling of heaviness than actual suffering, and discomfort in the back or loin are not constant or even very frequent symptoms. They occur in only 15 per cent. of Israel's cases, and he considers that the absence of pain can in no wise be regarded as a condition rendering the presence of tumor improbable. Chevalier, on the other hand, states that pain is an initial symptom among adults in 28 per cent. and among children in 7 per cent. of all cases. As the size of the tumor increases the disturbance of the general health, anemia, and cachexia appear as time passes and metastasis may be recognized later in the disease.

Changes in the character of the urine are sometimes entirely wanting and at others very striking. A large proportion of the cases will show hematuria and albumin will ordinarily be found as the result of the presence of blood unless there be some complication. Casts, crystalline elements, and pus are usually wanting, their presence indicating a complication. Pus may be found whenever there is an infection of any part of the urinary system.

Mention has been made by Guyon of the importance of varicocele as a symptom of renal tumor. He claims that the varicocele increases proportionately to the size of the tumor mass and the pressure upon the spermatic vessels. This symptom is

more likely to be met on the left side. In a number of cases it has not occurred and is unimportant as regards the early diagnosis of the condition. In the early stages the enlargement will show considerable mobility and in most instances moves with the diaphragm in respiration, although some observers have denied this. As the growth advances beyond the limits of the kidney pressure symptoms will be noted and ascites will develop. Rarely will icterus be present, and when it occurs it is an indication of the involvement of the tissues near the hilum of the liver. Elevation of temperature rarely occurs except in the later stages, when there is considerable tissue destruction. Cachexia and anemia occur as late symptoms.

The diagnosis of renal from nonrenal growths is to be made by excluding affections of the other abdominal organs, as ovarian and uterine tumors, tumors of the intestine, gall-bladder, stomach and pancreas. With careful attention to the history of the case, urinary findings, and the abdominal examination one should usually be able to make this differentiation. The differentiation between renal tumors and other enlargements of the kidney is in many cases no simple matter, and sometimes it is impossible. Hydronephrosis will often-times give the history of bloody urine and a steadily increasing enlargement in the side. Usually the history will show evidence of the passage of crystals in the urine which cause a suspicion of calculus and obstructed ureter. It may also result from the presence of a carcinoma of the uterus and adnexa with pressure upon the ureter. The same is true of prostatic enlargement. Again a marked mobility in the kidney may result in an intermittent hydronephrosis which, however, will show a variation in size from time to time, and the diagnosis under these circumstances should be somewhat easy. While an exploratory puncture might afford conclusive evidence it should not be used where there is any suspicion of renal new growth, because of the danger of the implantation of malignant tissue outside the diseased structure and also because of the danger of hemorrhage as noted in Brewer's case mentioned above.

Pyonephrosis will give evidence of pus in the urine unless the ureter be plugged, and the patient will give a history of elevated temperature, sweats, and other collateral symptoms. Tuberculosis of the kidney in the majority of cases can be diagnosed by catheterization of the ureter and micro-

scopic tests for tubercle bacilli; this may be supplemented by inoculation of lower animals and also the tuberculin reaction. Stone in the kidney presents so many symptoms in common with tumor that diagnosis between the two conditions becomes important. Crystalline elements, pus, and blood in the urine, the latter increased by motion and exertion, point strongly toward stone. Careful employment of the Roentgen ray ought to reveal the presence of stone. The shadow of a calculus will be sharply defined and somewhat dense, whereas that of tumor is rather dim in outline and gradually fades into the surrounding tissue. This is true in our case, where we only suspected a neoplasm because of the shadowy picture. Dr. Bruce, who made the skiagram of this case, leaned strongly to the diagnosis of renal new growth, having seen a similar case previously.

Differentiation of the special variety of tumor present in a given case is exceedingly difficult before operation. In determining the character of growths affecting the kidney we must take into consideration the age of the patient, whether one or both organs are affected, the rapidity of growth, and the amount of hemorrhage. Some writers claim that carcinomatous growths give rise to hemorrhage in the larger proportion of cases than do the benign growths or sarcoma. A few adenocarcinomata occur in young infants and children, but by far the larger number of tumors then occurring will prove to be sarcomata; the latter tumors also grow much more rapidly than do the carcinomata.

A tumor appearing in infancy or childhood, growing very rapidly, causing some hemorrhage, and not a great amount of pain except from pressure, would point strongly toward sarcoma. A similar growth in the adult with considerable hemorrhage, a tendency to metastasis, and a dragging weight or pain in the loin would most likely be a hypernephroma or a carcinoma. A growth of somewhat slower development, with perhaps hematuria as a symptom, or at least but little pain, would lead one either to the conclusion that he was dealing with a benign adenoma or an adenocarcinoma. Polycystic disease is usually bilateral. The same is true of secondary carcinomatous deposits.

Prognosis.—The prognosis of renal carcinoma is always grave, although radical removal in its early stages will offer about as large a percentage of recoveries as carcinoma in any other part

of the body. Prognosis becomes more grave with the increasing size of the tumor and with its fixation, the latter being an indication that there is a tendency for the new growth to break through the capsule of the kidney and attack surrounding structures. Metastasis is also an evidence of gravity, and if present is a contraindication to operation.

Primary mortality from nephrectomy for malignant growths has been reduced in the past twenty years from 60 + per cent. to 23 per cent. Garceau(23) collected 176 cases of hypernephroma in 143 of which nephrectomies were done, with thirty-three operative deaths, or 23 per cent. With earlier diagnosis and improved methods of technic we believe that the mortality should not be over 5 per cent. A very important consideration in this connection is the percentage of permanent cures which may be obtained after nephrectomy. The number of cases of adenocarcinoma is so small we are unable to reach any definite conclusion on this point in this class of tumors, but in Garceau's report of 176 cases of hypernephroma we find the following table:

Immediate operative deaths.....	33
Died later after operation.....	43
Survivals	31
Result not stated.....	<u>36</u>
Total.....	143

One of these cases, reported by Albrecht,(24) is unique in that four years after nephrectomy a bone metastasis occurred in the scapula, which was removed and the patient was still alive two years and seven months after the second operation. But taking the results from Garceau's report we have the following table showing survival after operation:

<i>Survival.</i>	<i>Number of cases.</i>
1 year or under	9
1 to 2 years	6
2 to 3 years.....	7
3 to 4 years	2
4 to 5 years	3
5 to 6 years.....	2
6 to 7 years	1
9 to 10 years	<u>1</u>
Total	31

Israel,(25) in 1901, reports reduction of mortality to 18.6 per cent. in his cases. Bloch(26) gives the following details of malignant tumor of the kidney, 126 in number, occurring in the clinic of Israel since 1901: "Nephrectomy was done 124 times, exploratory abdominal incision only twice. Of the 124 nephrectomies twenty-eight patients died shortly after operation, three by metastases of the original affection and cachexia during the course of the disease, accidents which have nothing to do with the operation. Therefore the operative mortality is 22.2 per cent.

"Counting three years as the minimum term of a permanent cure, twenty-six out of eighty-three patients have remained permanently cured, while three died accidentally after that time; 32.6 per cent. of all who lived after the operation and 27.7 per cent. of all patients operated upon have remained permanently cured. Counting five years as the minimum term of permanent cure, nineteen patients out of the eighty-one operated upon remained permanently cured, while in five patients the further course of the disease could not be ascertained. Thirty-five and nine-tenths per cent. of fifty-three who lived after operation, 25 per cent. of all operated upon remained permanently cured.

"The permanent results after removal of kidney tumors are better than after extripation of stomach and rectal cancers, and just as good as after the removal of mammary carcinoma."

The mortality of the operation is to-day 22.2 per cent. of all cases; in Israel's statistics of 1901 it was 18.6 per cent. This seems to mean worse results in spite of the improved technic, but it can be explained by the fact that during the last few years there were many of those advanced cases of kidney tumors which have still been operated upon on account of the improved technic, while they would have been excluded from operation in former years.

Treatment.—The only hope of recovery offered to a patient suffering from a malignant disease of the kidney lies in an early and complete nephrectomy. Partial nephrectomy has been practised at least five times for malignant tumors according to Morris,(27) but in every case the surgeon thought he was dealing with a benign tumor. The results were not encouraging. In cases which have progressed to an extent which forbids operative interference, palliation, in order to make the patient comfortable, is all that can be offered, inasmuch as treatment by toxins or sera has not been very satisfactory.

Contraindications to operation would be a markedly depressed state of general health, the evidence of disease of the other kidney, fixation of the growth, extreme enlargement and metastases. In the performance of nephrectomy the lumbar incision is the method of choice, except in those cases where the growth has reached a large size, when the abdominal incision is preferable.



FIG. 1.

Report of Personal Case.—M., æt. twenty-eight, was first seen September 23, 1909, with Dr. Bronner. This patient had a history of having had gonorrhea four years before and two years previously received an injury on a train. One year ago he had an attack of general abdominal pain with some radiation of pain along the urinary tract. About four months before I saw him he suffered from a fall, following which he had some considerable pain in the left side, and for five days there was quite an amount of blood in the urine. Later this symptom subsided and reappeared again about two weeks ago following a sudden exertion. His urine showed pus cells, some blood cells, staphylococci and a few diplococci, but no tubercle bacilli.

Careful examination revealed enlargement of the right seminal vesicle and also the left kidney was palpable and apparently slightly enlarged as well as mobile.

Diagnosis.—Traumatism, causing hemorrhage. The patient returned on March 16, 1910, with a history of another attack of hematuria in December 1909. Following this he was in fair health until March 1, when he developed an acute gonorrhea. Recently after lifting a log he began again to suffer from hematuria. He now has acute cystitis. His left kidney is large and tender and readily palpable, and gives an impression of increase in size since the last examination. The patient re

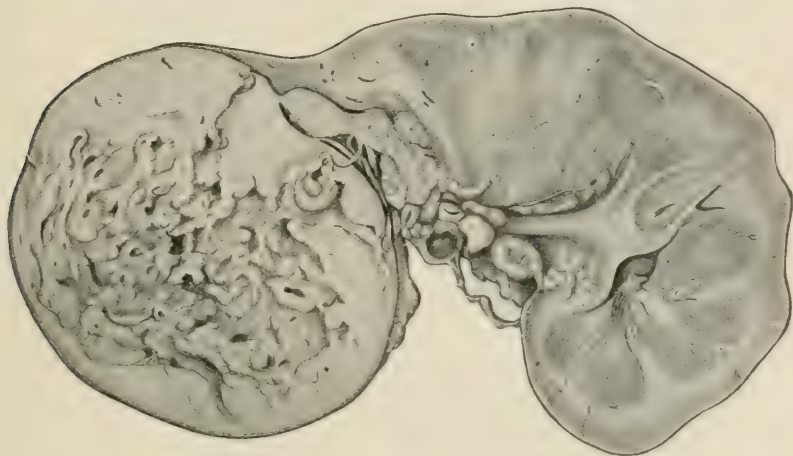


FIG. 2.

mained in the hospital until May 2, when there remained no evidence of the acute infection mentioned above. At this time an effort was made to examine the bladder and catheterize the ureter, but owing to the amount of irritation produced by the instrument upon the recently inflamed urethra we were unable to do this successfully. The skiagraph made by Dr. Edward T. Bruce showed a faint shadow in the left kidney region, not sufficient, Dr. Bruce thought, to resemble stone, but did resemble another case in which tumor was found.

Repeated examinations were made for tubercle bacilli and all were negative. The urine at no time showed any crystalline elements. The diagnosis was not positively made, but we felt sure from the size of the kidney and the amount of hemorrhage, as well as the deterioration of the patient's health, that operative interference was necessary. The latter was deferred for some

days, owing to a bronchitis with which the patient was attacked early in May.

Operation.—On May 7, 1910, assisted by Dr. Bronner, through an oblique left lumbar incision nephrectomy was performed, resulting in recovery. Upon incision through the kidney and growth, after its removal, the organ was found to be 6 inches

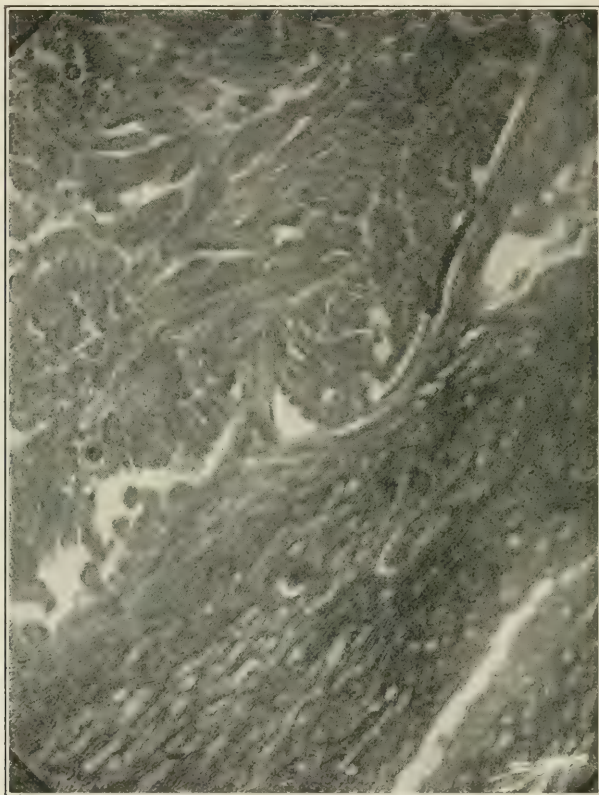


FIG. 3.

in length by $2\frac{1}{2} \times 2$ inches; at the lower pole an irregularly rounded nodular mass was observed. A number of branching vessels were seen on the surface of the tumor. On palpation it was not so resistant as the other portion of the kidney, and a few whitish spots were seen. On section the kidney appeared slightly congested, with a tumor 3 inches in diameter at the lower pole, apparently encapsulated with infiltration into the parenchyma and also into the fat about the pelvis. Inside the capsule

was a grayish-white mass of material a little firmer than thick cheese. The remaining portion of the kidney showed some congestion, but the tissue appeared to be almost normal except where the growth was infiltrated through what might be termed the capsule.

The following report of the pathological examination was made by Dr. John E. Hays, to whom I wish to extend thanks

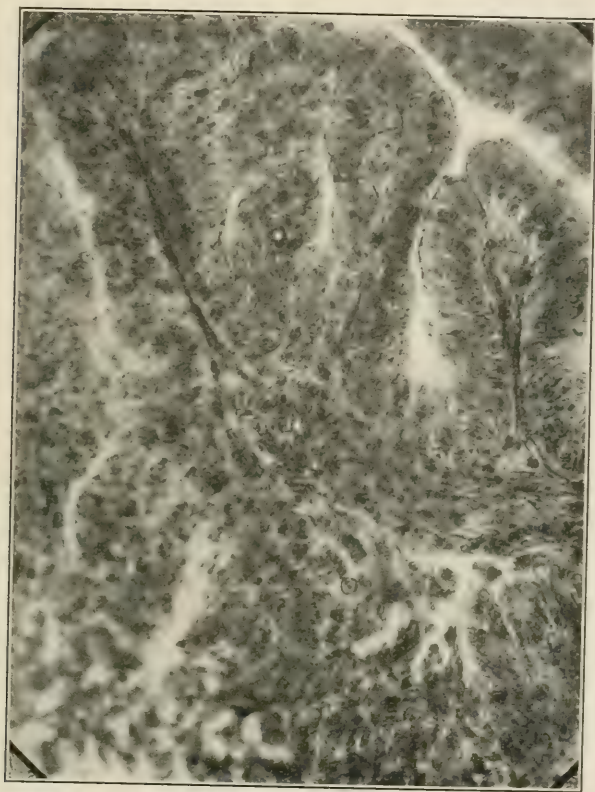


FIG. 4.

for his assistance. Macroscopically the specimen presents too well-defined areas. At the lower pole is seen what appears to be a large cavity filled with caseous matter, while above this is the kidney proper. The capsule of the kidney extends over and encloses the caseous mass, also seems to branch at the junction of this mass and the kidney, runs around the inner surface of the mass so as to give the appearance of complete encapsulation (see Fig. 2).

Blocks of tissue were taken from the junction of this mass and the kidney and from one of the nodules on the surface of the kidney. These were fixed in 4 per cent. formalin, hardened in alcohol, embedded in celloidin, sectioned and stained in hematoxylin and eosin.

On microscopical examination the kidney tissue is found to be undergoing parenchymatous and fatty degeneration, with small areas of hemorrhage and pigmentation. As the caseous mass is approached the renal tubules and Malpighian bodies are atrophied and compressed; in fact the elements are condensed to such an extent as to give the appearance of a capsule separating this caseous mass from the kidney proper (see Fig. 3). There is some increase of connective tissue here, but it does not

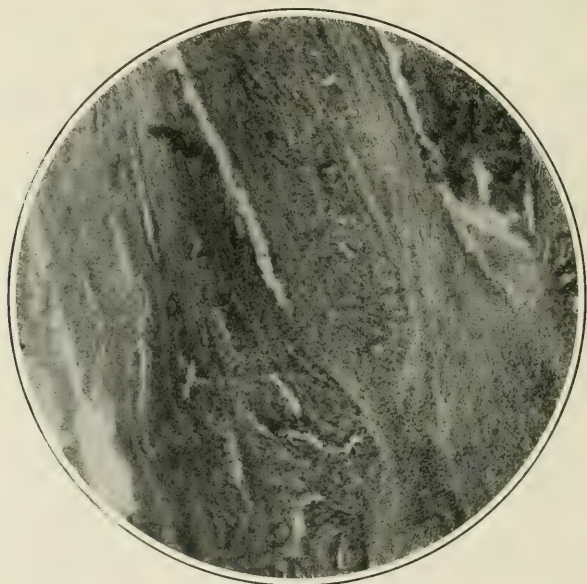


FIG. 5.

form a distinct continuous capsule. Between this pseudocapsule and the caseous mass we come to some of the tumor tissue. This is formed of one or more layers of glandular epithelium arranged in atypical tubules. When cut transversely these tubules seemed to be lined with one or more layers of glandular epithelium. The cells are very irregular in size and shape, the protoplasm full of chromatin granules with nuclei which take the stain in varying amount, some staining deeply, others very lightly. These tubules cut longitudinally and obliquely present a very complicated picture.

Hardly a tube is found that shows an even lumen bordered by a single layer of epithelium. Instead, the lumen is narrow at one place and wider at another, and at other places we do not see any lumen at all—only a mass of epithelial cells. Where the tubules widen out into quite large spaces there are found papilliform projections into the lumen formed of a narrow band of connective tissue covered with one or more layers of epithelial cells (see Fig. 4). Beyond this zone we come to the caseous mass

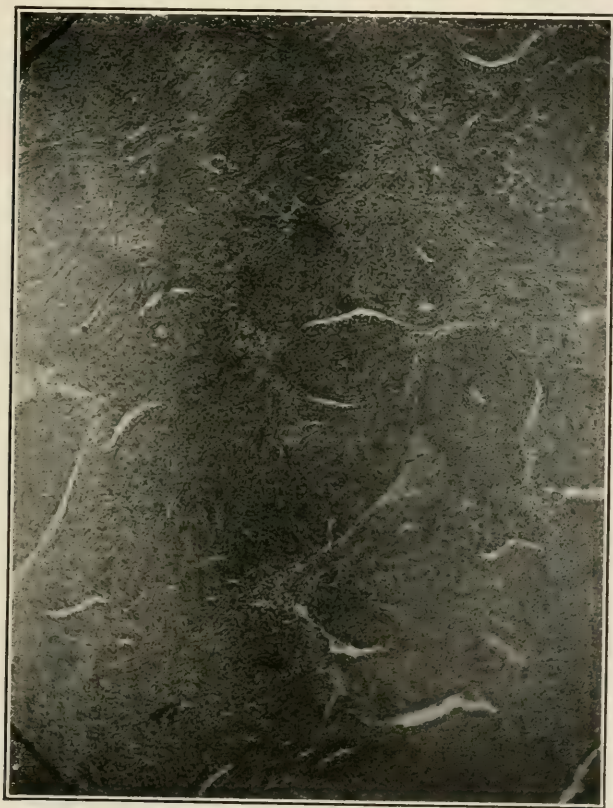


FIG. 6.

before mentioned. There is no structure of any kind found in this, only a mass of broken-down necrosed tissue. Whether it was once composed of tissue like that just described or normal renal tissue is a matter of conjecture. However, we do find some of this atypical glandular tissue in the outer covering of the mass (see Fig. 5). This may indicate that this necrosed mass might have been of the same structure at one time. Sections from the

nodule on the body of the kidney show the same structure as detailed above, except that there are no areas of necrosis, and other fields are found presenting an entirely different picture. We here find the bloodvessels surrounded by many layers of cells (see Figs. 6 and 7). These cells have a clearer protoplasm of fewer granules than the epithelial cells of the rest of the growth; their nuclei are larger and contain distinct nucleoli. I take it that these cells are of connective-tissue type and originate from the adventitious coat of the bloodvessels. We have here a

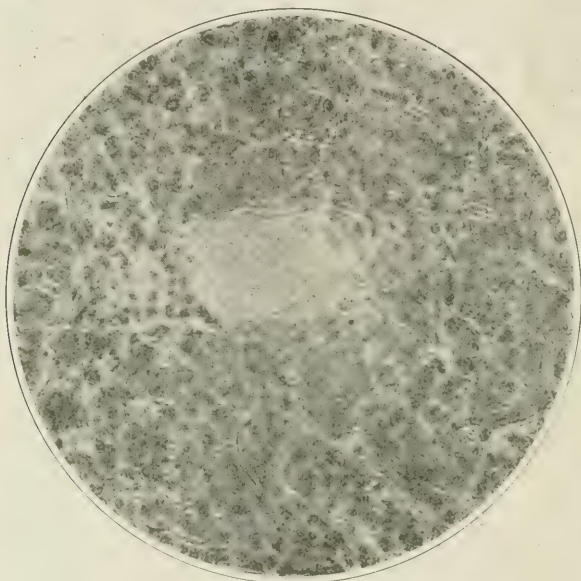


FIG. 7.

typical picture of what Zeigler(28) calls a perithelioma, a variety of hemangiosarcoma in which there is a proliferation of the outer layers of the wall of the bloodvessels and their immediate surroundings, so that the vessel lumina are surrounded by more or less thick mantle of cells.

The location of the morbid growth, upon the surface and under the capsule, for the most part would lead one to think that we had to do with an hypernephroma. The microscopical findings do not bear out this view. The character of the cells in an hypernephroma is entirely different from those found in this growth. In the first, the cells are like those in the cortical portion of the adrenal gland—large cells with clear protoplasm and

small nucleus arranged in columns on each side of a capillary network.

The preponderance of atypical tubular gland tissue, a rapid proliferation of cell elements with small development of connective tissue, and a tendency of these epithelial cells to invade the renal tissue constrain me to make the diagnosis of adenocarcinoma. The presence of the abnormal growth of cells around the bloodvessels, as noted above, does not negative this opinion. Zeigler expressly states that this condition may accompany other morbid growths in the kidneys, ovaries, and testes.

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- 542 THE ATHERTON.

THE BREAST OF THE EXPECTANT MOTHER: ITS CARE BEFORE AND DURING THE PERIOD OF LACTATION.¹

BY

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(With thirteen illustrations.)

THE questions paramount with me are these: is it possible through judicious management of the breast of an expectant mother to so condition the nipple that nursing may become to the mother the pleasant task that is intended? and, furthermore, is it possible to eliminate from the puerperium the so-called milk-fever? From those cases in which the physical culture has been faithfully carried out these questions can unhesitatingly be answered in the affirmative.

The greatest interest in the anatomical construction of the female breast centers itself upon the nipples and the ducts. Of the fifteen to twenty compound racemose glands, each gland has its individual lactiferous tube, which is formed by the union of four, six, or eight minute ducts. These tubes converge toward the nipple and become collected in a fasciculus beneath it. A firm cellular tissue supports them in this situation. As the lactiferous tube inclines toward the areola it dilates somewhat, forming the sinus lactei. At the base of the nipple, however, it narrows again and runs in a straight course to the summit of the nipple, where it terminates in a small opening. The nipple represents a conical, blunt-pointed, skin elongation with numerous papillæ studding its surface. These papillæ have a foliated appearance and are grouped in circular form about its base.

¹Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists at Syracuse, September 20-22, 1910.

The substance of the nipple is rich in muscle fibers, vessels, and nerves, imparting to it a marked degree of erectile power. Dotted about the summit of the nipple are the minute openings of the lactiferous tubes. Every obstetrician has met with some of the anatomical anomalies of the nipple. These abnormal formations may be due to a primary deficiency in its development. It may also be the result of faulty dress, causing the nipple to become forcibly imbedded in the glandular substance.

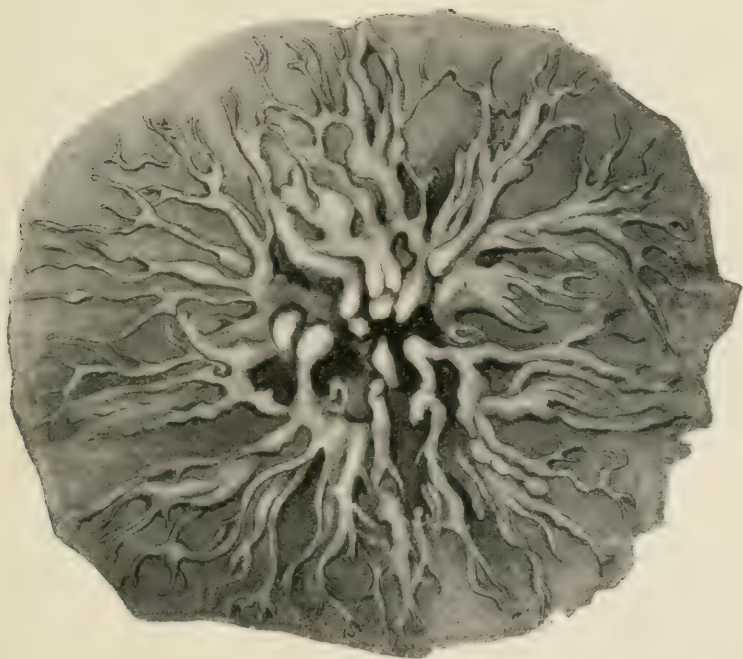


FIG. 1.—Lactiferous tubes or ducts, injected, showing their radiated direction and in some places their interrification.

Furthermore, an inflammatory condition, with deep-seated pus formation, may cause a retraction, or an unusually large breast may so engulf the nipple as to make it almost invisible. Every nipple that is not of sufficient size and proper shape to make it fit for nursing is a menace to the mother. Such a nipple predisposes to excoriations and fissures, not merely because of the inability of the child to properly nurse and evacuate the breast, but also on account of the milk and the secretions collecting in the corrugations and there undergoing decomposition because of the difficulty of thoroughly cleaning such a nipple.

It is the duty of the physician to see that the nipple is properly prepared for its future function. Unfortunately, this chapter of the pregnant state is too often entirely overlooked or only casually alluded to. The attention to a normal nipple should begin about eight weeks before the expected time of confinement. Nipples showing marked deviations from the normal require three to six months of a systematic massage to develop them to a state of usefulness.

In preparing a nipple it is the object to develop such form and size as to make suckling easy for the child and painless to the mother. It is not the desire to create a big and hard nipple, but rather a nipple that is soft and elastic. The advantage

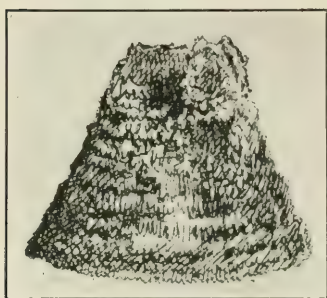


FIG. 2.—Upper showing papillæ, their foliation and arrangement.

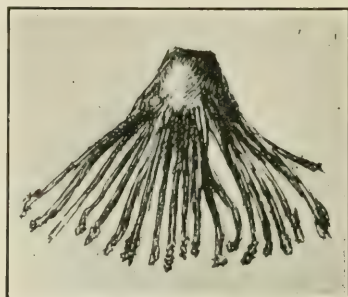


FIG. 3.—The nipple and the straight ducts.

the latter has over the former is that if it should become excoriated or fissured at a time during its function—and a nipple ever so efficiently cared for cannot be regarded as proof against a lesion—the excoriation or fissure will heal more rapidly and with less pain than in the nipple which is large and hard. It is seldom that nursing must be discontinued during the healing of a soft, elastic nipple, while with the other kind the pain caused by the suckling of the child is such that the mother often will not permit the breast to be nursed.

To properly prepare a nipple the expectant mother is instructed to use soap and water freely. After drying the breast, gentle friction with a rough towel or flesh brush is made for about five minutes. Following this rubbing, the nipple is massaged by rolling and kneading it between the fingers, gentle traction being made during these manipulations. The free use of olive oil during the process of massage, which is to be done

twice daily, is advised. It is surprising how an almost hopeless appearing nipple will in a comparatively short time assume the characteristics of a normal one. The application of alcohol and astringent lotions is to be condemned. A nipple cared for with these agents will become large, hard, and inelastic, presenting deep corrugations, which will impede the healing of any excoriation or fissure should such a lesion occur. The pain accompanying such a lesion brings many hours of suffering to the mother.

A nipple prepared by the method of systematic massage will usually withstand the strain of the nursing period without



FIG. 4.—Massage of breasts. Position of hands. Side view.

mishap. Its care after the child has commenced to suckle renders itself into one of simple cleanliness. Thorough ablutions after each nursing to free it from any accumulated secretions and the liberal dusting with boracic acid, which is washed off when the child is put to the breast, is all that is necessary. This regime, however, must be diligently adhered to. The care of the breast is as important as that of the nipple. Its anatomical structure gives evidence of how readily this organ is amenable to culture if only instituted properly and at the right time. The breast of a healthy girl that does not show development conforming to the incentive given by puberty should, after

an elapse of three years, be subjected to the stimulating influences of a systematic massage. This massage is to be continued until a normal equipoise has been attained. By developing the breast at this stage of womanhood many of the obstacles pertaining to a normal motherhood may be overcome.

The massage in reality is an exercise most simple in character. By placing a breast in the palm of each hand and locking the fingers across the chest, the young woman is asked to walk about in a well-aired room, and with a full inspiration force the hands apart. This exercise is to be repeated for at least fifteen minutes



FIG. 5.—Massage of breasts. Position of hands with interlocking fingers. Front view.

daily. It is most conveniently carried out upon rising and before retiring, and should be continued until satisfactory results evidence themselves. The normal breast of the expectant mother should receive some attention as soon as the physiological changes manifest themselves. In the primipara these changes occur very early, usually the second or third month, whereas in the multipara no changes may manifest themselves until a few weeks before the labor.

The breast during the pregnant state does not require the judicious management that the breast demands after lactation has established itself; however, it is of the greatest import, especially if the breast gives evidence of great fulness and tension with tenderness that the lactiferous ducts be maintained in as patulous and healthful a state as is possible; in short, the



FIG. 6.—Normal nipple.



FIG. 7.—Cone shaped nipple. Undesirable for nursing.



FIG. 8.—Stunted nipple. Caused by deficient development.



FIG. 9.—Mushroom nipple. A menace to the mother.



FIG. 10.—Fissure of nipple.



FIG. 11.—Mulberry nipple. A menace to the mother.



FIG. 12.—Retroverted nipple. Usually the result of inflammatory process in breast.



FIG. 13.—The engulfed nipple. Caused by the overhanging of an unusually large breast. A very troublesome nipple. Nursing usually impossible.

secretions in the tubes should not be allowed to become stagnant. It has been demonstrated that the staphylococcus albus and also the staphylococcus aureus find entrance into the milk ducts from the skin. In a woman, robust and in good health, whose labor has not been fatiguing, these microorganisms may produce no ill effect. On the other hand, in a woman who is delicate and whose labor has been severe these organisms may, at the time of the primary lacteal engorgement, produce alarming and distressing constitutional symptoms. These symptoms manifest themselves in a severe chill or a succession of chills, followed by a high fever, forty-eight to seventy-two hours after the birth of the child. This condition frequently is misinterpreted as to its character and has often been a cause for alarm.

That this so-called milk-fever is the result of these microorganisms having gained entrance into the lactiferous ducts, and having been stimulated into great activity by finding a proper medium in the milk for their propagation has been to me the only explanation. I assume its explanation upon the ground that as soon as the engorgement is relieved either by the suckling of the child or by the mechanical discharge of the milk with its bacteria-laden mass the "milk-fever" disappears. If the evacuation of the breast is attended properly and at regular intervals, no reappearance of the symptoms will occur.

It is maintained by some that milk-fever is an accompaniment of every normal puerperium. One could hardly be convinced that a chill followed by a high fever was necessary to usher in the period of lactation, and could be looked upon as a natural physiological process. The phenomena is rather characteristic of an inflammatory attack, and I am convinced that it can be attributed to a violent bacterial invasion. Massaging these organs daily from base to nipple with a liberal amount of sweet oil four months before labor is anticipated will in most instances entirely eliminate the so-called milk-fever from the puerperium.

Intelligent massage, in addition to the baby's being put to the breast at regular hours instituted before the appearance of the milk, will add greatly to the comfort of the mother after lactation has been established. With it excessive congestion and engorgement, the so-called "caked breast," and other troublesome conditions that often inflict unnecessary pain upon the mother will become less evident.

To keep a breast during the period of lactation in a healthy state it is necessary that its evacuation should be thorough

and at regular intervals. If the child is strong its application to the breast every two hours during the day and every three hours during the night should suffice. If the secretion, however, is excessive, other active measures should be applied. The breast-pump or a gentle massage toward the nipple will relieve the discomfort. To assist the organ to remain within its normal confines, a breast binder properly applied, with the glands well pressed forward upon the chest toward the median line and away from the axillary spaces, will encourage the natural process with the greatest possible comfort to the mother.

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PROGRESS OF THE YEAR IN GYNECOLOGY.¹

BY

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To a constantly increasing extent the profession is realizing the interdependence of disease. In no specialty is this tendency more marked than in gynecology. Newell(1) has within the past year emphasized the relation between nervous over-development and obstetric anomalies. Reynolds and Lovett(2) have written of orthopedics and gynecologic disease, and Goldthwaite(3) on the influence of posture upon the viscera. Monographs have been written on the relations between general diseases and gynecology, and the eye(4), the skin, the joints and the internal organs are all taking their respective places as causative factors in the origin of diseases or abnormal conditions of the female generative organs. With this widening knowledge comes the deeper consciousness of the necessity of the gynecologist being simultaneously a capable physician if he wishes to reach the primal causes of the conditions which afflict his patients.

Minor and major topics have been presented during the year, but as it is manifestly impossible to present them all in a sketchy review, I have contented myself with choosing a few of the more important subjects and in touching lightly upon some lesser ones. I have subordinated my own views entirely and have "editorialized" as little as was possible under profound temptation to do so.

The study of the interrelationship between gynecological disease and diseases of other organs was given a great impetus by the paper of von Rosthorn(5) who had been especially interested in the coexistence of cardiac disease and fibromyomata of the uterus. He could not persuade himself that a

¹ Read before the New York Obstetrical Society, October 11, 1910.

"habitus myomatosus" existed; nor could Winter(6) assure himself of any specific relation between myomata and heart disease. In the present year Neu(7) has reviewed the literature and has added a study of his own cases. He contends, quite sensibly, that we are not willing to regard every cardiac disturbance occurring in a patient with fibroids as caused by a "fibroid heart." He holds that the conception of a "fibroid heart" is not at present tenable, as convincing proof is lacking. Anemia is responsible for many of the symptoms on the part of the heart. He suggests minute and prolonged cardiac and hematological studies before and after operation in all patients in whom a so-called fibroid heart is found or suspected. He says the question cannot be settled until all patients with fibroids are clinically studied, to learn what deviations from the normal the heart may show, and until pathological studies of the heart are made with consideration of all modern views.

A topic which has occupied the mind and discussions of gynecologists during the past year is that of prolapse of the uterus. Before this society in March, 1910, there was an animated and instructive discussion(8) of this theme in which the society was joined by the Obstetrical Society of Philadelphia. The varying opinions expressed by different members of both societies showed that this important subject has not been cleared up. Goffe reiterated his theory of suspension by defect or by fault of which a prolapse of the uterus or bladder, or both, take place, in which position he is sustained by E. Martin and Bumm. Baldy took the position that lacerations of the pelvic floor were mainly at fault, while Dickinson augmented the work of Halban and Tandler(9) by describing the formation of four "cleavage planes". These are 1. postpubic, close to the bones, 2. in the urethrovaginal septum; 3. in the rectovaginal septum; 4. along the anorectal canal. Dickinson has worked along those lines for years and offers clinical conclusions and operative application. His article, embodying original observations, should be studied (42). The discussion following the presentation of the papers, including that of our lamented Jewett, showed that the tendencies among various operators are for their own selected modes of operation; yet the fact remained undisputed that, while many operations for prolapsus are successful, many are dire failures no matter what the technic employed may be.

At the Berlin Gynecological Society, the same topic was presented for discussion at three successive meetings in Novem-

ber and December, 1909, and January, 1910(10). Papers were presented by Bumm, E. Martin, Broese and Kraatz; and the differences of opinion among the men discussing the presentations were as wide as could be wished for. While all of them appreciated the work of Halban and Tandler, the excellent combination of gynecologist and anatomist, Martin presented anatomical specimens which demonstrated that the endopelvic fascia supports the uterus, vagina, and rectum by suspension, while the urethra, bladder, and rectum, are further supported by the pelvic fascia. These fasciæ enter the three organs laterally and leave between the uterus and rectum, and uterus and bladder respectively, openings which are filled with loose connective tissue. Martin says that a cystocele, being a mere bulging of the bladder wall forms in the retrourethral portion of the bladder, the denser connective tissue between the uterus and bladder has become defective in its support, thus permitting the falling forward of the bladder wall; that in suitable dissections of prolapsus, that it can be seen that the strong transverse fibers of the endopelvic fascia have practically disappeared; the prolapse, therefore, has occurred because the fascia which mainly holds the uterus in place has given way. He demonstrated one anatomical specimen of prolapsus uteri in which the levator ani group¹ was present intact showing that the levator ani muscle as such is no factor in the production of a prolapse of the uterus. He further states that the individual muscles of the levator group may be separated by a forming prolapse even when the muscles themselves are not torn. This is proven by the cases of virginal prolapse.

Bumm also attacked the findings of Halban and Tandler and emphasized the possibility of a congenital weakness of the supporting fasciæ of the uterus. He agrees with the views of Martin as to the overwhelming rôle played in descensus and prolapse by the endopelvic fascia. On the other hand, Bumm believes in the efficiency of proper plastic work when it is necessary in order to bring the pelvic floor into action as an opposing surface to the intraabdominal pressure. He also states that he has never seen any operator who has exposed the levator ani during an operation and maintains that it is a dangerous procedure and is usually likely to end in a perforation of the rectum.

By the Schauta-Wertheim operation of vesicovaginal inter-

¹ Martin describes the levator ani as consisting of a group of muscles the pub-rectalis, the ischiococcygeus, the ileococcygeus, and the pubococcygeus.

position of the uterus, Broese claimed 90.6 per cent. of cures. Kraatz decries amputation of the cervix in cases of prolapse, as a well-formed cervix can help to bridge the genital hiatus. Heidenhain(11), on the other hand, agrees with Halban and Tandler's findings and operates his cases without any reference to the uterus, depending solely upon a complete cystocele and perineal operation.

The discussion was participated in by Jolly, Mackenrodt, Strassmann, A. Martin, Mainzer, and many others. The conclusions leave the reader in a whirl of doubt as to the etiology of uterine prolapse; but it is quite likely that with further anatomical study the various factors making for this baffling condition will be elucidated.

Christides, (12) further reports eight cases operated by Beuttner according to the combined Freund-Schauta-Wertheim operation and reviews the literature of 300 cases. He emphasizes the minimal danger of the operation and the few recurrences which follow it.

As further contributions of the year to this subject may be mentioned Harris's proposed operation (13) of fixing the fundus between the recti muscles, sewing the fascia over it, and attaching the uterus to the fascia whenever they come into contact. Watkins(14) and Frankenthal(15) have each suggested operations for procidentia differing in details from many other operations, the essential feature of the latter being a vesicovaginal fixation, a modification of Freund's original operation.

A new operation for cystocele has also been described by G. R. White(16), who believes that cystocele arises by the breaking away of the vagina from its support, the white line of the pelvic fascia. His suggestion is, therefore, to suture the lateral sulci to this white line. The bladder is pushed back after an incision in the anterior vaginal wall is made until the spine of the ischium and the white line are reached and felt by the finger. Sutures are then passed beneath the white line where it joins the spine of the ischium. This is done with a Deschamps needle, the handle of which is then removed and each end of the suture threaded on a separate needle. One needle is passed from within out through the median edge of the incision, the other is passed in a similar manner through the lateral edge of the incision. Other sutures are then passed half an inch apart. When the suturing is complete, the lateral vaginal sulci are in contact with the white line of the pelvic fascia.

. It is also essential to mention Polk's suggestion for the correction of prolapse and retroversion of the uterus by approaching the vagina from above by the suprapubic route. He has just reported eleven cases so operated, eight of them with excellent result while the other three were operated upon too recently for final judgment to be passed. For the details of the operation, the reader is referred to the original paper(41).

Perhaps the most important theme of present-day gynecology is the tendency to bring cases of puerperal infection to a surgical treatment. This does not mean the mere opening of postpartum pelvic abscesses or the removal of putrid placental remains, but it refers to the ligation of pelvic, especially ovarian veins, as first suggested by Trendelenburg, or to hysterectomy. The general subject was treated by three papers at the 1910 meeting of the American Gynecological Society, of which a brief survey is given(17). Polak gave a review of 200 consecutive cases of puerperal sepsis with six fatalities. Of these, five cases of uterine and femoral thrombophlebitis recovered after a long illness. Two out of three cases of septic purulent peritonitis recovered. The treatment of these is important. An abdominal incision was made and a drainage tube inserted which was aspirated every three hours, the patient was placed in Fowler's position, and the continuous Murphy drip and gastric lavage were used. I consider Polak's conclusions so important as representing the conservative opinion of the day that I quote them in abstract:

1. Each case of postpartum infection must be studied individually and an accurate diagnosis must be made on the clinical, bacteriological, and blood findings before any treatment is begun.
2. Nature usually circumscribes and localizes the infection.
3. Operative procedures are to be avoided and are indicated only when there is evidence of intrapelvic or abdominal inflammation, necrosis, or suppuration.
4. Curettage, douches, and examinations during the acute stage are to be avoided as likely to spread the infection.
5. Pelvic exudates, enlarged tubes and ovaries may, respectively, disappear or assume their normal proportions.
6. All operations are attended with less risk after the acute stage has subsided and an exact diagnosis is easier to make at this time.
7. After the uterus is emptied, the pelvis should be left absolutely alone.
8. Extra-peritoneal drainage of local foci should be elected when possible, either by incision just above Poupart's ligament or by posterior

vaginal section, and when this is impossible because the exact anatomical relations of the local foci cannot be determined, an exploratory laparotomy is justifiable in order to make an exact diagnosis to determine the safest route for drainage. 9. Operative intervention in the acute stage of sepsis is indicated only in cases of general purulent peritonitis, postabortal pelvic peritonitis, infected tumors in or near the genital tract, and uterine rupture when this has occurred in the course of labor and is supposed to be infected; and, finally, thrombophlebitis is a conservative process on the part of nature to limit the spread of infection and any form of pelvic manipulation only tends to break down and separate parts of these thrombi, extending the infection to more remote parts, thus jeopardizing the patient's life.

Montgomery(18) spoke conservatively as well, calling especial attention to the rapid pulse in the face of moderate or nearly normal temperature as an evil prognostic sign. Vineberg (19) reported seven cases of a most didactic character. Five of these were instances of streptococcus infection, three of them dying and two recovering. The other two cases need not be considered here, as one of them showed a negative blood culture and the other was a case of rupture of the uterus presumed to be septic. Vineberg's comments on his cases are exceedingly interesting, but the study of the cases shows as well the impossibility of determining which instances of septic infection offer indications for radical operation and which do not. Vineberg admits the baffling difficulty of accurate diagnosis in his comments on Case 6. His paper is a very valuable contribution to the subject and deserves careful study.

Sampson(20) read a suggestive paper before the Sloane Alumni Association in which he reported four cases of intramural abscess of the puerperal uterus cured by incision and drainage only. Sampson was fortunate in his diagnosis in these cases, as he says it is not often possible and must be made by exclusion. It is a gratifying thing, undoubtedly, that some of these cases can be diagnosticated, but it is quite likely that many would terminate, if not operated upon, as broad ligament abscesses.

Pankow(21), in a study of the pathology and bacteriology of septic puerperal endometritis, regards it as important that all the tissues removed from a patient operated upon for puerperal septic conditions shall be subjected to the most critical bacteriological review, in order that some criterion may be

reached by which it may be possible to judge of the rapidity of the spread of the bacteria in these cases. Eventually, he believes, this will offer diagnostic possibilities and indications for operation which are at present entirely empirical.

Jaschke(22), of von Rosthorn's clinic, has made a thorough study of the means at our disposal for judging of the prognosis of septic puerperal conditions. He lays stress upon the paresis of the vessels controlled by the splanchnic system, the severity of the paresis depending, as in other acute infectious diseases, upon the severity of the disease. He regards the prognosis as good in cases in which there is no primary fall of the blood-pressure, or in which the fall is compensated by an increase in the strength of the cardiac beat, whether this comes about spontaneously or as a result of treatment. The prognosis is doubtful where there is a tendency to a falling blood-pressure which can be recognized by a variation in the second aortic sound. The prognosis is bad when the blood-pressure sinks simultaneously with a diminution in the intensity of the second aortic sound, and in those cases in which from the very beginning a lowered blood-pressure is accompanied by an insufficient cardiac action. Therapeutically, he suggests digitalis, caffeine, and adrenalin to maintain the blood-pressure.

The ever vivid subject of cancer of the uterus has been before us in many theses. The vaginal operation has again been urged as quite equivalent to the necessities of the case. Von Ott,(23) for instance, shows a surprisingly low mortality, in 277 cases operated by vaginal hysterectomy but five deaths, as compared with the extended operation of Staude and Schauta with respectively 20.2 and 11.1 per cent. of immediate mortality. Fifty-five out of 152 of his cases remained free from recurrence after five years. Schauta,(24) too, prefers the vaginal route. He says that the removal of the glands in carcinoma of the cervix is unnecessary if they are healthy, and if they are diseased they are usually not completely removable and relapses are just as common after the extended operation. The abdominal operation gives a greater primary mortality and there is greater likelihood of injuring neighboring organs. Relapses are no more common after the vaginal than after the abdominal operation. His results in 336 cases surpass the demands made by Winter's formula for a cure. Hartmann (25) believes that the results by the abdominal route are superior as to immediate and remote results, although the French sur-

geons do not make as extensive dissections as their German and Austrian colleagues(26). Zweifel(27) has suggested a modification of Wertheim's operation by incising the peritoneum behind the uterus and over the bladder and sewing these layers together before opening the vagina to avoid infection of the peritoneal cavity. The abdominal wound is then temporarily closed and the peritoneum got out of the way. Gillette(28), after reviewing the Wertheim operation and discussing its advantages, states that as good results can be achieved by the use of the electric cautery, and he believes that the heat acts on the cancer cells in such a way as to destroy them. The lymph spaces are also closed off by the heat, its influence extending far into the parametric tissue. Most abdominal operators are now refraining from the removal of the iliac glands, contenting themselves with a complete extirpation of the parametria.

The advocates of a total, rather than a subtotal, hysterectomy publish reports of cancer developing in the stump of the cervix. Two such cases are recorded by Hinterstoisser(29), after supravaginal amputation of the uterus; and for this reason he urges the regular examination of women who have been subjected to this operation. Mériel(30) speaks of twenty-two cases of malignant degeneration of the stump, collected by Richelot. He also mentions the leucorrhea frequently following the operation; and says that French surgeons generally are beginning to prefer total to subtotal hysterectomy. He does not believe that the mortality is greater in the former than in the latter operation.

Several writers have discussed the appearance of a bloody flow at regular or irregular intervals, following supravaginal operation; but this may be ascribed in many instances to imperfect technic by which too great a stump of the cervix has been left or by which considerable mucosa is retained. Thus Chaput(31) asserts that this bleeding may be obviated and infection avoided in supravaginal hysterectomy by excising the mucous lining of the cervix and pushing the entire stump of the cervix into the vagina and then closing the vagina above the cervical stump by suture. He first makes an incision into the anterior vaginal vault, slits the cervix and spreads it out flat, excises its mucous lining, sutures it into its original form and invaginates it. He regards this as a much safer operation than the usual one of suturing the stump from above.

Veit(32) suggests that as a prophylactic measure against thrombosis and embolism after gynecological operations, all venous bleeding be carefully attended to aseptically, that all veins be ligated in continuity before organs containing bacteria are opened. In this manner all embolisms arising from bacterial infection can be avoided. He urges this especially in vaginal operations.

In the treatment of parametritic exudates, Kirsten(33) advocates the injection into the exudate of normal saline solution to promote their absorption. He has done this in three cases satisfactorily, but as he himself remarks, the patients might have recovered as promptly if he had not resorted to the injections.

The use of the Roentgen-rays in gynecology has been studied by Matthei(34). He reports some cases of fibroids of the uterus which have become smaller under this treatment with a diminished menstrual flow. Tuberculous ulcers and fistulae did especially well under the influence of the x -ray. In the discussion, Prochownik said it is necessary to select cases carefully, that only women over forty with simple myomata are suitable subjects and that for the submucous variety the x -ray is useless. Sterility may be induced by the ray, hence young women should not be subjected to its influence.

There are numerous other topics which I could bring before you, but I believe that I have touched upon some of the principal ones. I cannot refrain, however, from mentioning the improvement in technics offered by Grossich with his iodine sterilization of the skin, and its modification by French surgeons of sterilizing the vagina in the same way. The desquamation of the skin following the iodine applications is still a deterrent to its use by many surgeons, but this will undoubtedly be overcome in time by the change in technic.

The advocates for and against early rising after laparotomy are still discussing the advantages and disadvantages of this procedure. Boldt, Wells, LeFort,(37) Hartog,(38) and others have written on this subject.

Peterson(35) in this country and Gabiet(36) abroad have written on the relationship between pregnancy and gynecological disease and gallstones, a topic which will undoubtedly receive more attention in the future.

The review of the literature made necessary for this paper demonstrates that conservatism is winning the day in gynecol-

ogy, and that the gynecologists of the world are giving their best endeavor and best thought to the elucidation of the problems which confront them. It is gratifying to realize that American gynecologists are doing their full share.

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- 136 WEST EIGHTY-FIFTH STREET.

PROGRESS OF THE YEAR IN OBSTETRICS.¹

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MOMBURG'S METHOD OF ARTIFICIAL ANEMIA BY AORTIC CONSTRICTION.

THIS method, devised by Momburg in 1908(1), consists briefly of encircling the abdomen midway between the crest of the ileum and the costal arch, tightly with rubber tubing nearly one inch in diameter. Two to four turns of the elastic cord are used, and the ends are securely fastened. The aorta is thus compressed against the lumbar spine, and when the constrictor has been properly applied the femoral pulse cannot be felt. When compression is to be removed constricting bands are applied to each thigh and the legs raised, so that restoration of the circulation occurs gradually, otherwise transient cardiac disturbances may result. The method is particularly useful in postpartum hemorrhage, and has been used in hundreds of cases with marked success. Momburg(2) claims that there is no damage done to intestine or ureter, and that postmortem findings have confirmed the harmlessness of the procedure. Krönig(3) states that the plan has been tested freely in obstetrical and gynecological work, with and without narcosis. He says that defects of technic are responsible for some failures, and that the femoral pulse must always be controlled, necessitating at times extra coils of tubing. He believes that, on the whole, it appears to be a simple and valuable resource, giving time for more complete preparation for permanent control of the hemorrhage. Weber(4) analyzes the experiences in Döderlein's clinic in Munich as follows:

The Momburg belt constriction was applied in eleven cases in which the hemorrhage continued with retained placenta. The clinical picture changed at once after the rubber tube had been wound around the waist; the bleeding stopped at once, the uterus

¹ Read before the New York Obstetrical Society, October 11, 1910.

became like stone, and the placenta was expelled in less than fifteen minutes without further hemorrhage. Equally favorable results were obtained in thirty-two other cases in which the atony developed after expulsion of the placenta. In four other cases the belt constriction permitted separation of the placenta with the hand without loss of blood, and in fifteen cases it much facilitated suture of bleeding tears in the cervix. In five other cases the constriction was applied until the femoral pulse became imperceptible and yet the hemorrhage continued, so that uterovaginal tamponing, according to Dührssen, had to be applied; possibly in these cases the stomach and intestines had been too full for successful constriction, or the aorta may have slipped aside.

The method in *gynecological* work, however, is not without danger. Buck(5) reports the case of a patient operated on for removal of a vulvar fibroma. The pulse and respiration were good during the operation and after removal of the tubing, but an hour later the pulse became imperceptible. It revived under saline infusion with a few drops of a solution of the active principle of the suprarenal gland and was at 160, persisting small and thready and varying from 140 to 160 for twenty-four hours. The operation had been done under veronal-scopolamin-morphin-ether general anesthesia. The heart remained very weak and severe enteritis developed but there was no rigidity of the abdominal wall, probably from injury of the innervation from the Momburg belt technic. The patient succumbed the next day with signs of diffuse peritonitis, and autopsy revealed patches of gangrene in the small intestine with resulting peritonitis. The circular strips of suffusion in the walls of the loops of the small intestine were unmistakable signs of direct strangulation from the constricting tubing. He explains the severe injury of the intestine in this case, while nothing of the kind was observed in the thirty-four other cases on record in which this Momburg technic has been applied, as owing to the fact that the patient was very thin and debilitated. This mishap warns against the use of this technic for very thin persons or when there is an ulcerated or chronic inflammatory condition of the intestine. Another possible danger is an ischemic paralysis of the distal end of the spinal cord, which Pagenstecher observed in one case.

HEMORRHAGES IN THE NEW BORN.

A marked advance has been made in the treatment by transfusion, as reported by Lambert(6), Swain Jackson and Murphy(7),

Mosenthal(8) and others. The results in these cases have been brilliant. Normal blood serum has also been successfully used by Welch and others. Welch(9) states that in eighteen recorded cases of hemophilia at the Lying-in Hospital, in which the usual treatment had been used, seventeen died.

Normal blood serum was then used in 12 cases, all of which were cured. He believes that even though the bleeding be due to a bacteremia the serum will still be an effective therapeutic agent.

SCOPALAMIN AND MORPHIN IN OBSTETRICS.

Much has been written concerning the use, advantages, and disadvantages of this combination of drugs. In my own experience in a comparatively small number of cases, the results were not specially satisfactory. Hatcher(10) in a careful review of the literature reaches a number of interesting conclusions.

He states that the technic of the use of these drugs, which is universally admitted to be essential to success, depends on a variety of conditions which cannot be fulfilled in the home; hence it is stated by nearly all investigators that the method is absolutely unsuited for general practice. Krönig states, however, that it depends on whether the general practitioner is willing to take the necessary time, care, and trouble to insure success. A fixed dosage is irrational, and the drugs must be used with reference to the physical condition of the patient, the nature of the operation, or probable course of labor, and due caution born of a full knowledge of the idiosyncrasies of the individual. To attempt to solve these problems in the home is to court almost certain failure.

Among his conclusions we find:

1. There are numerous contraindications to the use of scopolamin and morphin in child-birth.
2. It seems probable that scopolamin and morphin may have a sphere of usefulness in childbirth as well as in surgery, but there are many details which require perfecting before they can become generally useful even in institutions.
3. Scopolamin and morphin are wholly unsuited in the present state of our knowledge for use in general obstetric practice.
4. There is no possible excuse for the employment of ready-made mixtures (pills or solutions) of scopolamin and morphin, since each drug must only be used with reference to its individual

actions bearing in mind that these actions may be greatly augmented or modified by the other alkaloid.

5. The danger to the child must be kept constantly in mind, even when the utmost care has been exercised in the selection of cases suitable for the use of scopolamin and morphin, and when small doses are ineffective in inducing "twilight sleep" large doses should not be used.

TOXEMIA AND ECLAMPSIA.

Ewing(11), in speaking of the pathogenesis of the toxemia of pregnancy, tells us that all efforts to discover a specific poison in the fetus, placenta, or blood have failed, and some other conception of the disease must be found. He believes that eclampsia can only arise in an organism long prepared for it by disturbances of metabolism and associated organic changes. He also states that if there is any single distinguishing causative element in eclampsia, it is to be found in the nephritis and not in a specific poison from the fetus, placenta, or uterus. He refers to the rapid rise in ammonia nitrogen during the seizure, and to the rapid fall as the patient improves, and thinks that acute ammonia poisoning may be concerned in the symptoms of eclampsia. Ammonia is diffusible, raises blood-pressure, is an active poison to the nervous system, and its effects pass off rapidly. It also causes severe degeneration of organic cells and probably of leukocytes. Experimental studies have furnished important evidence that the thyroid and parathyroid are concerned in the toxemia of pregnancy and refers to the remarkable therapeutic effects of thyroid extract on which Foulkrod and Ward have reported. In summing up, he calls attention to the dangers of chloroform poisoning, and states that the relief of acidosis, the hygiene of the intestines, the correction of indicanuria, the careful control of the diet, the reduction or exclusion of proteids, and the intelligent use of thyroid extract should control the milder cases and reduce the mortality in the severe forms of the disease.

BLOOD PRESSURE IN TOXEMIA.

Green(12) states that blood-pressure bears a fairly constant relation to the other signs and is, in general, an index of the severity of the process, but that taken alone it is not a reliable guide.

Hirst(13) states that in the first half of pregnancy, with pernicious vomiting, blood-pressure is invariably *low*, while in

toxemia in the latter half of pregnancy, associated with albuminuria and eclampsia, it is invariably *high*. He believes that a high and rising blood-pressure is an invariable and early (often the earliest) sign of toxemia in the last months of pregnancy. The blood pressure in eclampsia remains high for forty-eight hours, then subsides and reaches normal in seven to ten days. A patient with a blood-pressure of above 150 needs active eliminative treatment and will in all probability require the induction of labor.

CHOICE OF ANESTHETIC IN TOXEMIC CASES.

The most recent paper dealing with this subject is that of Cragin and Hull(14), read at the last meeting of the American Medical Association, and soon to be published. The writer is indebted to the authors for permission to quote from the paper. These writers state that recent studies of the pathological changes produced by eclampsia, delayed chloroform poisoning, and chloroform anesthesia have shown a striking similarity in the findings. The pathological picture in each is that of congestion, hemorrhage, degeneration, and necrosis. They refer to the studies of various authors, including Howland and Whipple, which show the extent of degeneration and necrosis found in the liver and kidneys after chloroform anesthesia even of short duration. Howland and others were able at will, by continued chloroform necrosis, to produce delayed chloroform poisoning in dogs, with symptoms and lesions corresponding with those in man. It would seem, therefore, that chloroform in toxemia and eclampsia would still further impair these organs already damaged.

The authors then state their experiences in the use of ether in dogs, the anesthetic being administered for several hours on successive days. In none could necrosis in the parenchyma be found, the heart muscle was normal in color, there were no hemorrhages in the mucosa of the stomach and intestines, the kidneys were normal in size, capsules not adherent, the cortex not thickened, the markings distinct. The lines were of good color throughout, with no suggestion of necrosis. The protoplasm was somewhat granular, and there were small droplets of fat in the cells about the central veins and in the portal spaces, only slightly in excess of that in the controls.

These facts seem to demonstrate that, in animals at least, ether produces practically little effect upon the liver and kidneys, as compared to the marked changes in these organs produced by

chloroform. At the Sloane Hospital in the last year twenty eclamptic patients received ether whenever an anesthetic was necessary for delivery, and of this number only one died, this patient being practically moribund on admission.

In the previous twenty cases where chloroform had been used there were five deaths, while the previous mortality in 20,000 deliveries was 28.3 per cent. These twenty cases treated with ether seemed as seriously ill as the previous cases, and one of the nineteen had had thirty-one convulsions. The use of ether, therefore, in eclamptic cases seems to be rational.

STROGANOFF METHOD OF TREATING ECLAMPSIA.

Stroganoff(15) in a recent report reaffirms the efficacy of his method of treating eclampsia by keeping the patients under the influence of morphin, chloral, and chloroform with heat applied to the feet and kidney region, milk by mouth or rectum, and avoidance of any irritation (the details of his methods were given in the *Journal of the American Medical Association*, July 3, 1909, page 86, and September 20, 1902, page 733). The mortality of the mothers has been 6.6 per cent and of the children 21.6 per cent. in the 400 cases of eclampsia in which this method has been followed. He then describes his experience with it in some test cases in Vienna, saying that its systematic application would reduce the mortality below 2 per cent. as he has done in several long series of cases, without any necessity for hastening delivery or decapsulation of the kidney. The method would be well adapted for general private practice.

DECAPSULATION OF THE KIDNEYS IN ECLAMPSIA.

Lichtenstein (16) claims that through the rapid emptying of the uterus and other measures the mortality has been reduced to about 7 per cent., but he believes that some of these fatal cases would be saved by renal decapsulation. He states that in forty-three recorded cases the mortality was 41.86 per cent., but that in some four cases death was probably not due to eclampsia, so the net mortality would be 32.55 per cent. The method seems to have gained little if any headway in this country.

CESAREAN SECTION.

Vaginal Cesarean section has a limited field, in the cases of eclampsia from the fifth to the eighth month, where the cervix is

long and rigid, resisting the usual methods of dilation. In hospital practice and in the hands of competent operators it is in these conditions probably the safest, quickest, and best operative procedure.

The classical Cesarean section has steadily gained in favor, and may be called a finished procedure. Leopold(17), in a recent paper, states that in the seventy-nine classical operations performed at Dresden since 1905 the mortality has been only 1.2 per cent., as against a mortality of 6 per cent. in the 131 cases performed between the years 1882 and 1905. In the last sixty-four classical operations there has been no death. All of the children except one were born living. These results were obtained by 1. careful selection of cases; 2. examination of the secretions in each case; 3. uniformity in technic including the rolling out of the uterus, greatest possible hemostasis, and protection of the abdominal cavity; 4. perfect nacosis; 5. careful suturing, silk being preferred; 6. removal of all intestine from the lesser pelvis before replacing the uterus; and douching cervix and vagina with 2 per cent. carbolic solution or merely sterile water. The patient should be in the hospital for several weeks before the operation, internal examination is made once for all, no febrile patient is operated upon, and no case in which the fetal heart sounds are inaudible. Escape of meconium and prolapse of the cord do not constitute contraindications, nor does gonorrhea. A rubber tube is always used about the cervix, the author considering this step necessary to control bleeding perfectly.

Extraperitoneal Cesarean section has been performed now a number of times in German clinics, in preference to pubiotomy. Leopold(17) reports twelve cases with one death, the patient being septic at the time of operation.

The fetal mortality was 8 per cent. He believes that the only field for the operation is in cases of suspected infection, in which class of cases he gives the operation preference over pubiotomy. The high maternal mortality apparently comes from operating in actually infected cases.

Lange(18) has also abandoned pubiotomy in favor of the operation. He prefers the Latzko method whenever a strict extraperitoneal method is practicable, and in other cases a transperitoneal procedure outright. He has performed the operation in fifteen cases. In ten the Latzko method was begun, but could be completed in six only, accidents or

anatomical conditions making it necessary to go through the peritoneum.

In five cases the transperitoneal operation was done. Of the fifteen cases, one eclamptic died, and another had a septic puerperium, but recovered. All the rest recovered without incident sufficient to cause anxiety. The morbidity was much less than that of the classical Cesarean operation. The complications and sequelæ of pubiotomy were absent in these cases.

Of the fifteen children born, eleven were normal, four asphyctic. Only one could not be resuscitated, and this was a premature child in an eclamptic mother.

Döderlein(19) in Munich has operated in ten cases all but one primiparæ, with no deaths, and Schauta also thinks that the operation should replace pubiotomy.

RUPTURE IN THE CICATRIX.

Lichtenstein(20) states that in two personal cases and in nine which have been reported, subsequent pregnancy and labor progressed without any tendency to rupture, although labor in one instance lasted thirty-eight hours. The interval between the pregnancies was only from ten to fifteen months in six cases, and under twenty-six months in the others.

PUBIOTOMY OR HEBOSTEOTOMY.

The statistics of many hundreds of this operation are now available.

Schäfli(21) in 1909 collected 700 cases. The maternal mortality was 4.82 per cent. Of this number eighteen died of sepsis, several died of phlebitis, thrombosis involving the renal veins, and pulmonary embolism.

There were three deaths from hemorrhage and one each from shock and anesthesia. In perhaps three cases the death was not due directly to the operation.

The infant mortality was sixty-one or 9.18 per cent., chiefly from asphyxia, or cerebral hemorrhage. The morbidity was heavy.

Of 510 patients, in seventy-eight (15 per cent.) the hemorrhage was unnaturally profuse. Eighty-seven (17 per cent.) had hematmata. Seventy-nine had lacerations of the vagina. Other lacerations of the soft parts occurred in ninety-one (17.8 per cent.).

The bladder was injured in sixty-three (12.35 per cent.), 162 had a febrile puerperium (31.76 per cent.), forty-two (8 per cent.) had thrombophlebitis. In 120 cases subsequently examined, nine had hernia in the osseous gap, twenty-nine (24 per cent.) had prolapse of the vagina, and five (4 per cent.) had permanent incontinence.

Roth(22) reports the results from eighty-five operations performed in Leopold's clinic at Dresden. Two of the mothers died, a mortality of 2.35 per cent. The infant mortality was 7 per cent. These figures are better than those given in the collective cases reported by Schäfli.

One of the author's deceased cases had nephritis, and was badly torn in connection with high forceps delivery. Sepsis developed, and the intervention was damaging in every way. The patient had a narrow pelvis, but enlarging it did no good, for even the sacroiliac joints gave way, and later suppurated. This case proved that hebosteotomy cannot invariably widen a pelvis, and also that a patient having so serious a complication as nephritis should never be submitted to the operation. The second fatal case was doing well until the fifteenth day, when she died of pulmonary embolus. Autopsy showed thrombosis of the iliac vein. It is apparent that the great danger is thrombosis. The author would make the presence of any infection, even gonorrhea, a contraindication, likewise nephritis or valvular disease of the heart.

Marked hemorrhage occurred in fifteen cases, three of which were unusually severe; but no fatalities occurred from this cause. Lacerations of the vagina occurred in fifteen cases, ten of which were in primiparæ. Bladder injuries were more numerous in proportion than in the Schäfli series of cases. The author concludes with Schauta that pubiotomy and Cesarean section are not strictly competitive. A conjugate vera under 7 cm. demands Cesarean, above 7 cm. hebosteotomy may in some cases be the operation of choice.

In ten of the forty cases in which the women were examined later there were complaints of pain on long standing, walking, or lifting. In twenty-one of the thirty-eight women examined there was a tendency to prolapse of the vagina, or uterus, or both. In only six of the twenty cases in a subsequent labor was the pelvis found permanently enlarged.

In conclusion at Leopold's clinic it is believed that the operation should be done only in the hospital, never on primiparæ,

and as contraindications, any form of infection, nephritis or cardiac disease.

In America, Williams(23) reports his results in twenty-five operations, with the following conclusions:

1. There were no maternal and but three fetal deaths, only one of which is attributable to the operation.

2. All patients were delivered by forceps or version immediately after pubiotomy. There were no injuries to the bladder; there were six perineal and five deep communicating vaginal tears.

3. The relative infrequency of injury to the soft parts is attributed to restricting the operation to suitable grades of pelvic contraction, and to the employment of Döderlein's technic, but particularly to the extensive manual dilatation of the vagina and perineum prior to operating. The occurrence of such injuries may be still further decreased by making horizontal instead of upward traction when delivering the head through the vulva.

4. The after-treatment is not so onerous as is generally stated, and most of the patients suffer but little. Immobilization of the pelvis is not necessary, a four-inch adhesive strip around the trochanters being sufficient. The patients usually move spontaneously in bed between the second and fourth days, get up between the fifteenth and twentieth, and are discharged on the thirtieth day with satisfactory locomotion. Healing generally occurs by fibrous union, so that there is definite motility between the ends of the bone in at least two-thirds of the cases.

5. The maternal mortality should not exceed 2 per cent., provided the operation is performed by competent operators on uninfected women who have not been exhausted by previous attempts at delivery.

6. It is indicated in contracted pelvis when the conjugata vera exceeds 7 cm., and after a test of several hours in the second stage of labor has shown that the disproportion cannot be overcome, as well as in certain funnel-shaped pelvis.

7. Prophylactic placing of the saw is indicated prior to breech extractions or versions from transverse presentations when it appears problematical whether the head can pass through the pelvis and the bone sawed through immediately after discovering the disproportion.

8. In multiparæ with a history of repeated difficult labors, or in primiparæ presenting excessive disproportion, pubiotomy is

inferior to Cesarean section performed at the end of pregnancy or at the onset of labor; otherwise it does not enter into competition with it, as the former is the operation of choice in borderline pelvis after the patient has been subjected to the test of labor, and at that time it is many times less dangerous than the classical Cesarean section.

9. In uninfected women it should replace high forceps, prophylactic version, induction of premature labor, and craniotomy on the living child. In how far it may compete with supra-symphyseal Cesarean section must be shown by future observations.

10. It should not be employed in infected patients or after failure to deliver by other means. It should be regarded as a primary operation whose dangers are infection, deep tears, and hemorrhage.

11. When the separation between the cut ends of the bone does not exceed 4 or 5 cm., the patients recover perfectly and are able to walk and work as well as previously.

12. In view of the fact that the bone section usually heals by fibrous union, a certain degree of permanent enlargement of the pelvis may follow, particularly in the transverse diameter of the outlet, and less so in the conjugata vera. Under the influence of the hyperemia incident to a subsequent pregnancy, this may occasionally become markedly exaggerated and be sufficient to permit spontaneous labor. Should this not occur, a second pubiotomy may be performed; while Cesarean section should be limited to those cases in which the pelvic contraction is marked and the child large.

PUERPERAL SEPSIS.

Vaccine therapy has during the last few years been used with varying success, but at the present time the whole subject of treatment of sepsis by vaccines and serums may be considered as still in the very early experimental stage.

The conclusions of the committee on vaccine therapy of the American Gynecology Society, consisting of Williams, Cragin and Newell were in part as follows:

Vaccine therapy is undoubtedly a valuable remedial agent in local infections due to the tubercle bacillus or staphylococcus, less so in local infections due to other pathogenic bacteria, while there is considerable doubt as to its efficiency in acute general infections.

In infections of the urinary tract, especially those due to the colon bacillus, it sometimes results in symptomatic cure, but rarely relieves the bacteriuria. The scanty reports concerning the pyelitis and the pyelonephritis of pregnancy indicate that vaccine therapy is no more efficient than the usual treatment.

In certain cases of endometritis, it appears to reinforce the curative influence of curettage. The reports concerning its use in pelvic inflammatory disease are too scanty to justify conclusions.

In a recent paper, Deaver, DaCosta and Pfeiffer(24) report some very favorable results of vaccine therapy as an adjunct to surgery.

Of seventeen cases all profoundly septic, nine with streptococci recovered from the blood, three were lost.

Of five cases of staphylococcus bacteremia, all recovered. In four of these, the results appeared to be marvelous.

Of eight cases where no bacteria were found in the blood, five showed streptococci and three staphylococci. Of the five cases, three recovered, two died; of the three cases, one died.

Their conclusions were as follows:

1. Vaccine treatment is of no benefit in the later stages of streptococcus bacteremia.
2. Staphylococcus bacteremia has been treated with most favorable results in all stages.
3. Septic intoxication without demonstrated blood invasion in a majority of cases displayed general and local improvement under vaccines if given early.

It would seem, therefore, that the future holds out hope of great improvement in the treatment of sepsis by vaccines.

WASSERMANN REACTION.

The statistical results of studies of the Wassermann reaction during the past five years show that this test is given practically only by persons suffering from active syphilis. Some cases of other diseases such as leprosy and scarlet fever also give a mild reaction, but these conditions can usually be easily excluded by their clinical symptoms.

The reaction is not usually frequent until about the time of the appearance of secondary lesions. During the primary period only 30 to 50 per cent. of cases give any reaction. During the secondary stage nearly all cases react unless they have been thoroughly treated. Patients with active tertiary lesions

usually give a reaction. Many of the latent cases after disappearance of the secondary lesions give marked reactions unless treatment has been very thorough.

Women without symptoms who have given birth to syphilitic children show a reaction in about 60 per cent. of cases. (Inasmuch as the reaction is now considered to be one of the symptoms of the disease though not necessarily an evidence of immunity, our views on Colles' law have been changed, for the mothers of syphilitic children are not healthy and immune, but as a rule have a latent syphilis and consequently have an apparent immunity merely.)

Apparently healthy children born of syphilitic mothers usually give a negative reaction until the symptoms of the disease begin to appear, several weeks postpartum.

It must always be remembered that a negative reaction, especially in a patient under treatment, is of no value in excluding syphilis.

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ACUTE HEMORRHAGIC PANCREATITIS WITH REPORT OF CASES.¹

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ALTHOUGH Senn twenty-five years ago and Fitz three years later by numerous experiments and masterly essays gave us a clearer conception of diseases that affect the pancreas, the medical profession were slow to take advantage of this knowledge. During the past five years, however, diseases of the pancreas have been a frequent topic for discussion and surgeons now have a better knowledge of the subject and rational methods of surgical attack have been developed.

The anatomical relations of the pancreas, the lesions which affect it, and their etiology were so obscure, that until comparatively recent times very little had been accomplished in the way of accurate diagnosis and early surgical interference. It is only by repeatedly calling to the attention of the profession the fact that diseases of the pancreas occur more frequently than we were wont to believe, and by carefully studying the etiology and accurate histories which include intelligent observations of the symptoms and signs in a large number of cases, that we, some day, may be as certain of making as correct a diagnosis of acute hemorrhagic pancreatitis as we are to-day of acute appendicitis.

Acute hemorrhagic pancreatitis, and suppurative and gangrenous pancreatitis are merely different stages of the primary disease. Hemorrhage into and about the pancreas may be the only lesion found to explain a sudden death. We may briefly refresh our memories by a review of the location of the pancreas. The gland lies retroperitoneally, behind the stomach at the level of the first lumbar vertebra. The head is embraced by the second and third portions of the duodenum, opposite the second and third lumbar vertebræ. The neck extends, about 3 cm. in length, obliquely upward to the left, where it joins the body, which extends transversely to the left becoming the tail that reaches the hilus of the spleen.

¹ Read at the Twenty-third Annual Meeting of the American Association of Obstetricians and Gynecologists at Syracuse, September 20-22, 1910.

The pancreas in front is in relation with the duodenum, the gastrocolic omentum, transverse colon, and stomach. Posteriorly it rests upon the inferior vena cava, left renal vein, aorta, superior mesenteric vessels, thoracic duct, left kidney, and suprarenal capsule. The splenic artery and vein and the hepatic artery are in relation to the posterior surface and upper border. The fourth portion of the duodenum and the beginning of the jejunum are inferior, while above and to the right of the neck and head are the gastroduodenal and pancreaticoduodenal arteries. The common bile duct passes along a groove in the head of the pancreas for a distance of from 2 to 9 cm., in about one-third of the cases, and is embraced by the head of the pancreas in the other two-thirds.

The pancreas is made up of acini grouped into lobules that secrete the pancreatic juice, which drains either into the duct of Wirsung or the duct of Santorini. The islands of Langerhans occupy a central position in the lobules and are distinct from the acini in structure and appearance. They have no ducts but connect directly with an efferent bloodvessel. They control the internal secretion of the pancreas. The duct of Wirsung, usually larger than the duct of Santorini, passes through the entire length of the gland and for a distance of 2 cm. lies parallel with the common bile duct with which it joins and forms the ampulla of Vater which is situated from 8 to 12 cm. below the pylorus. The average length of the ampulla is about 4 mm. The duct of Santorini drains the larger of the two lobes which form the head of the pancreas. When patent, which is so in about one-half of the cases, it enters the duodenum by a small papilla just above the Vaterian papilla. It usually anastomoses with the Wirsungian duct. It is found at times larger than the duct of Wirsung; thus occlusion of the latter may cause but slight disturbance.

The blood supply of the pancreas is derived from branches of the splenic, hepatic, and superior mesenteric arteries, named the superior and inferior pancreaticoduodenal arteries, and their numerous branches. The efferent vessels empty into the portal system through the splenic and superior mesenteric veins. Experiments have shown that an animal can live but a few days at most after complete removal of the pancreas, thus proving that the pancreatic juice and the internal secretion of the pancreas are essential to life. We know comparatively little of the *modus operandi* of this internal secretion, nor of the internal secretions of the thyroid gland, the parathyroid bodies, Brunner's glands, the suprarenals, and the testes. We know that the island

of Langerhans elaborates the internal secretion of the gland and that this secretion controls the assimilation of sugar or, as one author states, the metabolism of the carbohydrates.

The relative positions of the pancreatic and common bile ducts and the frequency with which the bile channels become infected, and the subsequent tendency to the formation of biliary calculi, render the pancreas vulnerable, most commonly, at the ampulla of Vater. The most common cause of pancreatitis is some previous infection of the biliary tract. We may have the infective material carried to the pancreas through its ducts by a stone becoming arrested in the ampulla of Vater, occluding the outlet through the greater papilla; and yet the stone so small that it does not completely fill the ampulla, thus allowing the bile to enter the pancreatic duct direct. A stone lodged in the common duct at a point where this duct lies parallel to the pancreatic duct may so press upon the latter duct as to cause occlusion of the same, thus preventing the outflow of the pancreatic secretion. Enlargement of the head of the pancreas from any cause may produce occlusion of the common duct and cause secondary changes in the bile ducts and liver. Catarrhal jaundice may be produced in this manner.

Infective material may enter the pancreas through the blood-vessels or the lymphatics. Near the head of the pancreas we find that the efferent lymphatics from the gall-bladder meet the efferent lymphatics from the pancreas. Intestinal contents may enter the ampulla of Vater following the dilation of its duodenal opening by a stone. We must not lose sight of the fact that pancreatic calculi may also give rise to symptoms. The characteristic lesion found in pancreas disease is fat necrosis. The presence of fat necrosis always means that there has been sufficient injury of the gland to allow the escape of its fat splitting ferment, which reduces the fat molecule into a fatty acid and glycerin. The acid combines with calcium-forming calcium salts. Numerous small, opaque, white or yellow areas spoken of as areas of multiple fat necrosis have been found in the omentum, mesentery, subperitoneal fat, retroperitoneal fat, in the pancreas, diaphragm, and heart. Frequently a narrow hemorrhagic zone surrounds these areas.

The symptoms of acute hemorrhagic pancreatitis are either a history of occasional attacks of indigestion or of no digestive disturbance; or infection of the bile passages; sudden excruciating pain in the epigastric region radiating to the left and through to

the back; the pain usually more severe than that due to gastric perforation or gallstones. Large doses of morphia give but slight relief. Nausea followed by vomiting at frequent intervals occurs; but the vomitus is seldom fecal; the sudden seizure is followed by collapse, or varying degrees of shock. In some instances there is a cyanotic appearance or lividity and the facial expression is extremely anxious. The temperature at the onset is subnormal and, as a rule, but slightly elevated even in the later stages; cases, however, have been reported with a high temperature almost from the beginning of the attack. The pulse rate is increased in frequency or is feeble and at times scarcely perceptible. Dyspnea is a prominent symptom and hiccough may be very distressing.

There is rigidity in the epigastric region most marked over the left rectus muscle and tenderness on pressure midway between the end of the ninth rib and the umbilicus. Soon we have epigastric distention which is tympanitic on percussion and there is a board-like rigidity over the abdomen and pain in the back, especially in the costoilic space on deep pressure. Usually the bowels are constipated but there may be diarrhea. An acute anemia may supervene. Occasionally a mass may be felt in the region of the head of the pancreas. Jaundice may precede or occur during the attack. There is an increase in the leukocytes and especially an increase in the polymorphonuclears. In rare cases sugar may be present in the urine, especially during the early stages of the disease; but it is usually absent. Fat may be found in the stools which are soft and may look like butter or may be oily and are very offensive. Nuclei are present in the muscle fiber found in the stools if the pancreas has undergone complete degeneration.

The Cammidge reaction C is said to be of undoubted value, by Robson and Cammidge, when considered with the clinical symptoms, a complete analysis of the urine, and a chemical examination of the feces. Goodman and Speese considered the Cammidge reaction of value from the positive results they obtained by examinations following the production of pancreatitis in dogs by ligating the pancreatic duct. Willis, McGrath, Pilcher, and Balfour working under the direction of Wilson, director of laboratories at Rochester, Minnesota, after unusual and painstaking methods of making the Cammidge test C and eliminating the bias in judgment which the laboratory technician is prone to, when he is familiar with the clinical history of the

case, give the following as one of their conclusions—namely, "That even when the most elaborate care is exercised to follow the technic of Mr. Cammidge's C reaction, in the most uniform manner, if knowledge of the clinical histories and other factors of the personal equation be eliminated, the end results, judged by Mr. Cammidge's own criteria, must be considered as a means of diagnosing disease of the pancreas, as both valueless and misleading."

Perforation of the stomach, duodenum, and gall-bladder give symptoms which resemble acute hemorrhagic pancreatitis. In duodenal ulcer we have pain before meals when the stomach is empty, and hyperchlorhydria with eructations. A careful study of the previous history, the sudden onset of unbearable pain in the epigastric region, vomiting often continuous, shock, localized tenderness in the epigastric region and costoiliac space, low temperature, rapid pulse, severe dyspnea, cyanosis, anxious expression, rapid distention in the epigastric region, with a chemical examination of the urine and stools should make us reasonably certain of a diagnosis of pancreatitis. If one is in doubt an exploratory operation is advisable as soon as the patient rallies from the period of shock. If upon opening the abdomen one finds the omentum, mesentery, or other parts studded with white or yellow plaques of fat necrosis or beef-broth-like serum, we should at once look to the pancreas for the cause.

Treatment.—In the early stages morphia, enteroclysis, and supporting measures. The operative measures are carried out usually by making an incision in the region of the right rectus above the umbilicus. An opening is then made through the gastrocolic or gastrohepatic omentum. Multiple incisions may be made in the peritoneum covering the pancreas, or the gland itself may be incised. Whether secondary operations upon the bile passages should be performed at once, or whether it may be more desirable to wait until the patient has recuperated somewhat from a severe illness, by drainage of the pancreatic area alone is a problem worthy of consideration. The correctness of the judgment of the operator may be the saving factor for the patient. The pancreas is sometimes drained through the costoiliac space; but the numerous bloodvessels found posterior to the pancreas have deterred surgeons from preferring this route. Thorough drainage has at times been employed and in certain cases it would seem to be desirable. Opening the abdomen alone

may effect a cure, which we also know may happen in tuberculous peritonitis.

CASE I.—*Acute Hemorrhagic Pancreatitis. Bloody fluid in the Abdominal Cavity. Fat Necrosis. Gall-bladder and Ducts Normal. Drainage. Recovery. Twenty Months later Operation Pancreatic Cyst. Drainage. Recovery.*

A negro, forty-two years of age, was admitted to the Rhode Island Hospital, August 2, 1909, on the service of Dr. W. L. Munro and gave the following history: one week before entering the hospital he was taken with sudden sharp pain in the epigastrium with severe and repeated vomiting. Prostration was marked at the onset, then the patient recovered somewhat but has been confined to his bed, suffering from constant pain in the epigastric region, dull and aching in character. On the day of admission his breathing was rapid, expression of the face anxious, and he looked acutely sick. The tongue was coated and the breath heavy. The abdomen was moderately distended. Tenderness most marked in the right upper quadrant over the gall-bladder region. There was rigidity on the right side of the abdomen with considerable muscular spasm.

Operation.—August 4, 1909. Dr. W. L. Munro. High right rectus incision. Areas of fat necrosis were found about the intestine and omentum. The gall-bladder was normal. The head of the pancreas was enlarged and very hard and greenish in color. A quantity of serosanguineous fluid was found in the abdominal cavity. The patient's condition became serious from the shock of the operation and the abdomen was closed with drainage. He recovered in thirty-seven days and was discharged relieved of symptoms.

April 5, 1910, the patient was readmitted to the Rhode Island Hospital on Dr. Keefe's service. For four months he has had a slowly growing mass in the epigastrium, accompanied by chronic indigestion and occasional aching pain. On the day of admission he was seized with a sudden sharp pain and collapsed while walking in the street. He was brought to the hospital in the accident ambulance.

April 9. Operation. Dr. Keefe. Gas-ether. Upon opening the abdominal cavity a large cyst was found which originated in the body of the pancreas. It was filled with a large quantity of dark fluid which resembled altered blood. The cyst was sutured to the parietal peritoneum and a drain was inserted. The patient was discharged three weeks after the operation. The wound was completely healed and the patient was entirely relieved of symptoms.

CASE II.—*Acute Hemorrhagic Pancreatitis. General Peritonitis, Fat Necrosis. Died.*

The patient was a man fifty-three years of age. I saw him with Dr. Chesebro, his physician, November 7, 1906, and he was admitted to the Rhode Island Hospital.

He has had considerable gastric disturbance for the past

two years. Two days ago while on his way to work he was seized with a pain in the region of the umbilicus. He vomited a large amount on several occasions. The pain increased in severity at night. Pulse 108. Temperature 99°. Respiration 24, white count 12,400. The abdomen is much distended and is tympanitic. Very tender on pressure all over the abdomen. There is movable dullness in both flanks indicating free fluid in the abdominal cavity.

November 7. Operation. Dr. Keefe. Gas-ether. Incision in the median line below the umbilicus. About one quart of thin yellow fluid was found in the abdominal cavity. The appendix was normal. The incision was enlarged upward, the gall-bladder and stomach were found normal. The intestine was injected but no perforations were found. The omentum was matted together in places, which proved to be areas of inflammation. Areas of fat necrosis were found in the omentum and mesentery in the epigastric region. No enlargement of the head of the pancreas. Two cigaret drains were introduced down to the pancreas and the wound closed about these drains. The patient died shortly after the operation. No autopsy.

CASE III.—*Acute Hemorrhagic Pancreatitis. Bloody Fluid in the Abdominal Cavity. Gall-bladder and Ducts Normal. Died. Autopsy.*

A man. Forty years old. Admitted to the Rhode Island Hospital, June 19, 1908. 11:00 A.M. At 9 o'clock last night he was taken with abdominal pain which lasted a few minutes. He went to work this morning and at 9 o'clock he was again taken with general abdominal pain and went home. The pain grew worse and he vomited several times. Morphia given when sent to the hospital. Pulse 140, temperature 98° and respiration 45. White count 25,000. The countenance is pale and the body is covered with perspiration. The abdomen is rigid and tender all over. There is general dullness over the abdomen.

Operation.—Dr. Hollingsworth. Cocaine as a local anesthetic. McBurney incision. About a pint of reddish fluid escaped from the peritoneal cavity. The appendix was not found nor was there any inflammatory condition about the cecum. The patient was in poor condition. Three large cigaret drains were introduced and the wound closed about these drains.

June 20. Died 2:00 A.M. Autopsy made sixteen hours postmortem. The abdominal cavity contains a thin, brownish-red fluid, there is slight injection of the bloodvessels of the parietal and visceral peritoneum but very little loss of the glistening quality of its surface. Appendix normal. Pancreas shows marked changes. About three or four cm. from the right end the nearly normal tissue begins to be replaced by friable necrotic tissue and clotted blood. This condition extends for 5 cm., including the whole of that part of the body of the pancreas. Very little change from the normal is found in the tail. The tissues immediately about the pancreas show fat necrosis and

are infiltrated with clotted blood. No obstruction of the pancreatic or bile ducts found. The gall-bladder is normal and not distended; its contents are normal.

CASE IV.—*Acute Hemorrhagic Pancreatitis with Fat Necrosis. Brownish, Black Bloody Fluid. Gall-bladder and Ducts Normal to the Touch. Died. Partial Autopsy.*

A man forty-eight years old entered the Rhode Island Hospital November 15, 1908, on Dr. Cutts's service. The patient was well until eight days ago when he was suddenly taken with severe pain in the epigastric region followed by vomiting. The pain and vomiting have continued. Four days ago he became jaundiced. Constipated. Pulse 116. Temperature 99.8°. Looks moribund. Patient is conscious and is able to give a little history but is very sick. There is marked jaundice. A large firm mass the size of a croquet ball fills the epigastric region and is situated a little more to the right than to the left of the median line. The mass is not movable or very tender on pressure. It was thought to be an enlarged gall-bladder filled with pus. The lower abdomen is held quite tense. History of syphilis eleven years ago.

Operation.—Dr. Cutts. Ethyl chloride and ether. An incision at the outer edge of the right rectus over the tumor mass in the epigastrium was made. The mass which was adherent to the abdominal wall consisted on the outside of adherent omentum. An opening was made through the omentum into the mass, and a brownish-black fluid with a peculiar odor escaped. The gall-bladder was normal to the touch. The omentum showed small white areas, 1/8 inch in diameter, of fat necrosis, which was also proved to be so upon microscopical examination. The abdominal incision was closed about the drains with through-and-through sutures of silkworm gut.

November 18. Died. The kidney, pancreas, and portions of the liver and mesentery were removed through the operation wound after death. The pancreas is of a deep pink color but its surface is covered in places with black and gray necrotic tissue and blood clots. It is firm in consistence. In places yellowish areas are seen under the surface which vary in size from a few mm. to 2 cm. in diameter. On section the cut surface is of a brownish-yellow. Hemorrhagic areas are scattered over it. The yellow areas previously noted are found to invade the pancreatic tissue to some depth and they are also scattered throughout the substance of the organ. They are composed of soft necrotic tissue. There is some extravasation of blood into the pancreas.

CASE V.—*Acute Hemorrhagic Pancreatitis. Straw-colored Fluid in the Abdominal Cavity. Fat Necrosis. Gall-bladder and Ducts Normal to Sight and Touch. Drainage. Recovery. One and One-half Years Later Four Gallstones Removed at Operation. Recovery.*

I saw with Dr. Joseph Bennett, December 16, 1908, a married

woman twenty-five years of age. She has had three children, the eldest four years old, and she is now nursing the youngest child who is five months old. Never any serious illness. Ten days ago she was seized with severe abdominal pain located in the upper half of the abdomen. The pain radiated through the back and up to the right shoulder. The pain is independent of the time of the ingestion of food. Vomited several times. The vomitus looks like the white of eggs, or is thin and greenish in color. Conjunctivæ slightly yellow. Four days after the onset she was up and about the house, but did not feel well. She has taken very little nourishment since her illness.

December 16. To-day she was again seized with severe epigastric pain and was in a state of collapse when I first saw her. The face was ashen-gray, and the expression was extremely anxious. She looked like one *in extremis*. The pulse was rapid and thready but the temperature was normal. The abdomen was distended. Muscular rigidity was very marked especially in the epigastric region. No mass could be felt by palpation. The tongue is yellowish, brown, and dry. The patient was transferred to the Rhode Island Hospital and rallied under stimulation.

December 17. White count 20,000. Temperature 101.8°. Considerable pain but not enough to require anodynes.

December 18. Patient looks sick and is more uncomfortable; the pulse is weaker. Urine is of high specific gravity and contains sugar and a few hyaline casts. A second specimen showed no sugar present.

Diagnosis.—Acute pancreatitis or perforation of the stomach, duodenum, or gall-bladder.

Operation.—Dr. Keefe. Ethyl chlorid and ether. Incision 4 inches long just to the right of the median line commencing at the free border of the ribs. A small amount of free clear fluid was found upon entering the abdominal cavity. The omentum and mesentery were found studded with small white areas of fat necrosis. Attention was now given to the pancreas by making an opening through the gastrocolic omentum. The pancreas was large and had softened areas of necrosis. Three large cigaret drains were inserted down to the pancreas. The gall-bladder and ducts were carefully palpated, but no stones could be detected. The gall-bladder was normal in thickness and color and looked absolutely healthy. It was filled with a normal quantity of bile and bile could be forced out of the gall-bladder by pressure. The gall-bladder was not drained. The wound was closed about the cigaret drains.

December 20. Patient fairly comfortable, wound has drained freely. One drain removed. December 21. Bowels moving freely, normal in color. Second drain removed. December 22. General condition improved. Third drain removed, wound irrigated, and a small cigaret drain inserted. December 30. Daily dressings, thin discharge containing pancreatic juice which

irritates the skin to a slight degree. Urine shows no sugar but a few hyaline casts are present. There were sixteen examinations of the urine made on different days but only on December 18 was sugar present and then only a small amount.

On January 8 and 15 she vomited and had rise of temperature, which may have been brought on by a too generous diet. January 25 the patient was discharged from the hospital and a few weeks later the sinus was entirely closed.

The patient was readmitted to the Rhode Island Hospital June 15, 1910, and I am indebted to Dr. W. L. Munro for permission to publish the subsequent history, which I obtained from the hospital record. Two years ago the patient was admitted to the Rhode Island Hospital and operated upon by Dr. Keefe; diagnosis of acute pancreatitis having been made and confirmed at operation. The patient was discharged improved after an uninterrupted convalescence. Her health has been good since the previous operation, until the onset of the present trouble. The patient has increased about forty pounds in weight, appetite and digestion good, bowels fairly regular, no symptoms.

Four days before the present admission the patient had a severe attack of pain in the epigastrium, radiating through to the back and accompanied by nausea and vomiting. Pain has continued steadily but the patient has not vomited since the onset. The bowels have been constipated; the patient has eaten practically nothing. The attacks of pain are not associated with the taking of food, position, or bowel movements. No urinary symptoms, no alcoholic stools, and no jaundice. Examination negative except for abdomen. Abdomen is slightly distended and tender throughout. Marked tenderness and rigidity is found in the right upper quadrant and on deep palpation an indefinite mass can be made out, lying in the epigastrium, more to the right than to the left of the median line. The mass lies under the scar of the previous operation, it is not movable and does not appear to be attached to the abdominal wall. There is dullness on percussion.

June 18. The patient has had some pain but not severe since admission; the pulse and temperature have continued normal.

June 24. The patient had a severe attack of pain, accompanied by rise of temperature and pulse rate. She vomited repeatedly small quantities of yellowish-green fluid.

June 25. Operation. Cholecystostomy by Dr. Munro under ether anesthesia. An incision was made in the right epigastrium, near to and partly including the scar of the previous operation. The intestines, stomach, and gall-bladder were adherent to the parietal peritoneum and to each other. The head of the pancreas was normal in size, indurated, and buried in a mass of dense adhesions. The gall-bladder was freed from adhesions with difficulty and opened. Four gallstones about the size of a cherry pit, with a small amount of bile mixed with mucus and pus were removed. Cultures were taken from the gall-bladder. A

rubber drainage-tube was inserted into the gall-bladder and held in place by a purse-string suture. The gall-bladder was anchored to the partial peritoneum by sutures of plain catgut. The ducts were explored and though buried in dense adhesions seemed free from obstruction. The abdomen was closed by a figure-of-eight through-and-through suture of silkworm gut. Two large cigaret drains were placed at the head of the pancreas and common duct.

June 27. The patient vomits frequently. Draining very little through the tube. There is a purulent discharge along the drains. The temperature continues high. The patient complains of pain in the incision. In the afternoon the patient had an attack of severe pain, accompanied by symptoms of collapse. Marked dyspnea. Atropin, strychnia, and nitroglycerin given subcutaneously with oxygen inhalations. This attack lasted about an hour.

June 30. Patient much better. Drainage-tubes shortened. Temperature is gradually approaching normal.

July 4. The stitches were removed. The wound is healing by granulation. Patient in apparently good condition; temperature ranges from about 100° to normal.

July 10. The tube was removed. No further suppuration of the wound. There is a sinus to the gall-bladder which discharges normal bile. The patient is comfortable.

July 20. The patient is sitting up in bed. The wound is discharging bile freely. The pulse and temperature are normal.

August 8. Convalescence uninterrupted. The sinus to the gall-bladder shows no tendency to close. Draining freely.

August 20. The patient was discharged to-day improved. She has had no return of symptoms. She still has a small sinus leading to the gall-bladder which discharges a small amount of normal bile daily. The stools are normal in color.

CASE VI.—*Cholelithiasis, Acute Hemorrhagic and Gangrenous Pancreatitis. Fat Necrosis. Sugar in Urine. Died. Autopsy.*

A woman sixty-five years of age I saw with Dr. Edward S. Allen on February 16, 1909, and obtained the following history: Two years ago the patient had an attack of pain in the right hypochondrium accompanied by nausea and vomiting. A diagnosis of gallstones was made at the time. Six months ago she had a second attack with well marked jaundice. About three weeks ago she had pain in the gall-bladder region, with temperature ranging from 99 to 100°. The bowels are constipated. There is great tenderness upon pressure over the right epigastric region. Two days ago she began to vomit and the vomiting has persisted ever since. The urine contains sugar. There is muscular resistance in the right hypochondriac region. Operation was not then advised, owing to the feeble condition of the patient and the presence of sugar in the urine. Later a mass developed to the right of the median line, in the epigastric region.

Diagnosis.—Gall-bladder disease with gallstones probably

present and suppurative pancreatitis. Operation advised and performed March 4, 1909. The patient's general condition was very bad. Gas and ether were given for three minutes and a rapid operation performed. An incision was made over the mass through the right rectus into the abdominal cavity. The omentum was found to be adherent to the structures beneath the right hypochondrium. There were small white and yellow areas of fat necrosis in the omentum and mesentery. An opening was made through the gastrocolic omentum into the mass. A large amount of thin pus was evacuated from the region of the pancreas. The cavity was irrigated and a rubber tube and cigaret drains were introduced. The wound was closed about the drains by layer sutures. The patient improved temporarily, but gradually failed and died March 20, 1909.

Autopsy.—A number of gallstones were found in the gall-bladder but none in the ducts. Areas of fat necrosis were numerous in the omentum and mesentery. The operation wound led down to what little remained of the pancreas, nothing in the way of normal pancreatic tissue was found; it was merely a sloughing slate-colored mass.

Diagnosis.—Cholelithiasis, acute hemorrhagic pancreatitis, and later chronic suppurative and gangrenous pancreatitis.

CASE VII.—*Gallstones Removed. Drainage of Gall-bladder. Fifteen Months later Acute Hemorrhagic Pancreatitis. Died. Autopsy.*

A man fifty-four years of age was admitted to the Rhode Island Hospital on the service of Dr. E. B. Smith.

Twenty years ago he had an attack of pain in the right upper quadrant of the abdomen. Two years ago he had a similar attack and was jaundiced about one week. Three weeks ago he was seized with pain in the gall-bladder region, he became jaundiced and had clay-colored stools. He was constipated and the urine contained bile. He had considerable subcutaneous fat. There was slight resistance upon deep pressure in the right upper quadrant of the abdomen.

April 6, 1908. *Operation.*—Ether. A high incision was made through the right rectus muscle and upon opening the gall-bladder three large and thirty small stones were found and removed. A small stone could be felt in the cystic duct; but for some reason it was not removed. A drainage-tube was placed in the gall-bladder from which bile flowed the third day following the operation.

April 27. Three weeks after the operation the wound was healed and the patient was discharged.

The patient was readmitted to the hospital July 30, 1909, sixteen months later, on Dr. Munro's service. Six days before admission he was suddenly taken ill with severe pain in the upper part of the abdomen with repeated attacks of vomiting. He had a chill and perspired freely. The chills and sweats have recurred several times. The pain subsided into a dull persistent

ache and was most marked in the gall-bladder region. There is marked prostration with difficult breathing. The pulse is rapid and weak. There is a hernia at the site of the operation wound. There is marked tenderness in the right upper quadrant and muscular rigidity over the entire right side of the abdomen.

August 2. Dyspnea is more severe and the abdominal distention has increased. The pulse is irregular and rapid.

August 3. The patient died.

Autopsy.—Numerous white spots are found throughout the great omentum; these are found on section to be necrotic areas. Adhesions of omentum and ileum to a hernial sac are found beneath the abdominal wound. There are dense fibrous adhesions between the tip of the gall-bladder, liver, and anterior abdominal wall. On the posterior wall of the abdomen are many yellowish necrotic areas from $1/2$ to $1\ 1/2$ cm. in diameter. These are more numerous about the duodenum and pancreas; but extend to the brim of the pelvis. Upon opening into the lesser peritoneal cavity, the stomach is found to be adherent to the pancreas and on separating these adhesions, an abscess cavity was found containing thick viscid yellow pus. White necrotic areas are found beneath the peritoneum on the anterior abdominal wall.

The pancreas is enlarged. It is greenish black in color and is almost entirely covered with yellowish, necrotic patches. In places the tissue appears increased in consistence and in other places it is soft. The head of the pancreas is firmer in consistency than the remaining portions. Upon section no typical pancreatic tissue is evident. The gall-bladder contains white viscid material. The walls are thickened and the mucous membrane is roughened. The cystic duct at its junction with the hepatic duct contains gallstones. Another gallstone is firmly lodged in the ampulla of Vater. A probe, however, can be passed down the common duct by the side of the stone into the duodenum. The stones are about the size of a white bean. Smears from the gall-bladder, the abscess about the pancreas, and the necrotic areas in the omentum all show pus cells, degenerated tissue, and Gram-negative bacilli.

CASE VIII.—*Acute Hemorrhagic Pancreatitis. Bloody Fluid in the Abdominal Cavity. Pancreas enlarged; Gall-bladder and Ducts Normal to the Touch. Died.*

A man aged thirty years, a clerk, was admitted to the Rhode Island Hospital, August 2, 1909, to Dr. Hollingsworth's service. He complained of pain after eating, with occasional vomiting attacks for the past three months. Two days before admission he had a sudden sharp pain in the epigastrium with repeated vomiting of greenish material. He became very much prostrated. The bowels have moved each day. There is epigastric distention and tenderness on pressure all over the abdomen but it is greatest over the upper right rectus region. The abdomen is tympanitic on percussion. The pulse is rapid and irregular

and the temperature is 99°. He has had a hernia for five years which has been irreducible for a few days. It was thought that he was suffering from a strangulated hernia.

Operation.—Dr. Hollingsworth. Cocaine anesthesia. The hernia sac was opened and found to contain omentum and a thin milky fluid; there was no strangulation. A second incision was made into the abdominal cavity in the upper right rectus region and a large quantity of dark bloody fluid was encountered. The pancreas was found enlarged, dark in color, and very adherent to the omentum. A sudden and copious hemorrhage occurred in the region of the head of the pancreas and the patient died upon the operating table. The gall-bladder and ducts appeared normal. There was no autopsy.

These cases are of interest from several standpoints. Two cases recovered of the eight cases reported. Two patients were operated upon twice. One was operated upon for acute hemorrhagic pancreatitis and one and one-half years later was again operated upon and four gallstones removed from the gall-bladder. Dr. Gile of New Hampshire reports a similar case. He operated for acute hemorrhagic pancreatitis and his patient was operated upon about one year later by Dr. Irish and a number of gallstones were removed.

Another case in this series was operated upon for acute hemorrhagic pancreatitis and some months later a pancreatic cyst was removed. The events were reversed in one of the cases. Thirty-two gallstones were removed but a stone was left in the common duct. The patient some months later died from acute hemorrhagic pancreatitis. We should keep in mind the close relationship between infection of the bile passages and disease of the pancreas. While we should strive to make more accurate diagnosis in lesions of the upper abdomen in obscure conditions, we should not delay but should operate early, as most of the conditions that simulate disease require surgical interference.

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259 BENEFIT STREET.

CONSERVATISM IN OPERATIONS ON THE UTERINE APPENDAGES.¹

BY

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IN this brief consideration of conservative surgery of the uterine appendages I shall make no effort to review its quite voluminous literature, but shall confine myself almost entirely to conclusions arrived at as a result of personal experience and observation in this class of surgery. In the first place conservatism is indicated in all women within the child-bearing age requiring surgical interference for diseased adnexa due to causes other than tuberculosis or malignancy.

True conservatism has for its objects:

1. The removal of pathological tissues or the institution of such treatment as will permit these tissues to so far return to normal as to perform their physiological functions.
2. The relief of the various disturbances and symptoms resulting from the presence of disease.
3. The maintenance of the integrity and patency of the Fallopian tubes on one or both sides, in order that their function as oviducts may be retained.
4. The conservation of all of both ovaries, or as much of both or of either as is consistent, with the correction of the

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pathological condition present. This is necessary in order that the three important physiological functions of the ovary may be retained: first, ovulation, thus rendering conception possible; second, the preservation of the menstrual function, thus avoiding the nervous disturbances and atrophic changes incident to the artificial menopause; and third, the maintenance of the internal secretion or trophic influences over which the ovaries are believed to preside.

5. The maintenance as nearly as possible of the normal anatomical relationship of the ovaries and tubes to each other and to the other pelvic viscera.

6. The covering over as nearly as possible of all raw surfaces, resulting from the breaking up of inflammatory processes, thus minimizing the dangers of postoperative adhesions.

Conditions of the appendages, in which conservative work should be considered, may be divided into three classes:

First.—Noninflammatory neoplastic ovaries with normal tubes.

Second.—Noninflammatory pathological condition of one or both tubes.

Third.—Inflammatory condition of one or both tubes, with or without involvement of one or both ovaries.

The first class, or neoplastic ovaries with normal tubes, offers a brilliant opportunity for conservative work, not alone for the preservation of the procreative functions, but also that the very important menstrual and internal secretion functions may be retained. There are three varieties of microcystic diseases of the ovary—namely, the corpus luteum cysts and the Graafian follicle cysts which begin in the cortex and the Rokitanski cysts which are distributed universally throughout the whole ovary. Besides these there are dermoid cysts and occasionally an unusually large corpus luteum, or Graafian follicle cyst, will be encountered. There is, lastly, the enlarged sclerotic ovary.

In the microcystic ovaries the indication is as far as possible to puncture all cysts and remove their lining membrane. Frequently these cysts will be so numerous in one portion of the ovary that resection is necessary. This is usually the case in the Rokitanski cysts. In the larger cysts considerable ovarian tissue may be saved near the base of the tumor surrounding the pedicle, which is as a rule the remains of the hilum. In the large sclerotic ovary it has been my custom to resect such an amount of ovarian tissue, as will bring the organ down to the

normal size, and the results have been very satisfactory. In plastic work on the ovaries the sutures should be so introduced as to control bleeding, obliterate dead space, and accomplish accurate coaptation.

In the second class of noninflammatory pathological conditions of one or both tubes may be mentioned ectopic gestation and cases of benign neoplasms, usually fibroid. In tubal pregnancy, whether ruptured or unruptured, operative treatment should be influenced, first, by the condition of the tube and ovary of the opposite side. If the opposite tube and ovary are in good condition it has been my invariable custom to remove the ectopic tube. In the event of a crippled tube on the opposite side, or a possible double ectopic, if seen after rupture, the margins may be trimmed and coapted with chromic gut, or if seen before rupture the tube may be incised, the products of conception removed and the tube closed with chromic gut just as the uterus is after Cesarean section. After this is done the fimbriated extremity must be split open if it is occluded and mucous membrane stitched to the peritoneum. I have only seen one case of ectopic pregnancy occurring in both tubes, and this woman was so nearly dead from hemorrhage, following the rupture of one tube, that there was no opportunity for conservative work. In cases of newgrowths of the tubes, which are most frequently fibroid, the treatment is identical with that of myomectomy of the uterus—namely, to enucleate the tumor and close the cavity with catgut, being sure that the sutures do not unduly constrict the lumen of the tube.

It is a much more difficult matter to outline any routine method of procedure in the third class of cases, or those in which there is an inflammatory condition present. Here we have to deal with a septic process and the indications are to conserve functioning organs as far as is consistent with the safety of the patient and as the ravages of the disease will permit. The infection in inflammatory diseases of the tubes and ovaries is nearly always from the uterus, although it is possible to occur through the lymphatics, and rarely by an extension from a diseased appendix. By far the most usual occurrence of infection of the appendages is by extension from the uterus of either a gonorrhea or puerperal infection. In the acute stage of either of these infections the chance for conservatism is not so favorable as far as the tubes are concerned, for if they be left patent the infection in the uterus which the occlusion of the tubes had

limited would then be poured into the peritoneal cavity. However, as will be shown later by a case report, even in these acute conditions there is an opportunity in properly selected cases for conservatism.

In acute infections of the ovaries, which are nearly always associated with involvement of one or both tubes, it is rarely if ever necessary to remove all of both ovaries, even though they both may contain considerable quantities of pus. An all wise providence has in its beneficence seen fit to provide woman with two of these sacred organs, and has ordained that the very important work of the two can be carried on by one or by even a part of one; consequently it behooves the pelvic surgeon to respect this prodigality and generosity on the part of nature and to lend his best efforts to conservatism rather than to ruthless destruction. Even though both ovaries contain pus, with the general cavity carefully protected from contamination by gauze packs the pus may be aspirated and the ovaries then opened up into the abscess cavity. This should be sponged out with normal salt sponges, and if there be a pyogenic sac it should be either wiped out with a gauze sponge or removed with a curet. This procedure may be carried out on both sides.

In acute inflammation of the tubes, whether due to gonorrhea or puerperal infection, operation should be deferred until the condition has become subacute or chronic, unless conditions should arise which demand interference. If this course be pursued and the proper treatment instituted a large percentage of gonorrheal tubes will get well without operation, while the puerperal tubes will become shut off from the general peritoneal cavity by adhesions and the patient establish more or less of an immunity to the infection, thus reducing very materially the dangers of operation. In operative cases of acute pyosalpingitis the question as to whether an effort should be made to preserve any part of one or both tubes must depend upon several conditions: first, the type of infection, whether gonorrheal or puerperal, the former being more favorable for conservatism; second, the extent and location of the pus and the apparent amount of destruction to tissues produced by it; and third, the general condition of the patient (always assuming that she is within the child-bearing age). In favorable cases where the inflammation involves chiefly the outer part of one or both tubes resection may be done, then a longitudinal incision of from $1/4$ to $1/2$ inch may be made along the upper border of

the stump and the mucous membrane and peritoneum stitched together with fine interrupted catgut sutures.

The same plan of treatment is indicated in chronic inflammations of the tubes and ovaries as has been outlined in the care of acute infections. The chronic or subacute variety, however, offer a more favorable prognosis as regards restoration of function. The most favorable type of chronic inflammatory tubes for conservative work is the hydrosalpinx.

As illustration of the foregoing, I beg to report the following two cases:

CASE I.—Mrs. L. B., age twenty-three, married six years, sterile, although she had had two curetments done, hoping that conception might follow. On opening abdomen both ovaries were cystic, one the size of a large grapefruit and the other about as large as a medium-sized lemon. The uterus was retro-displaced with the fundus resting in the hollow of the sacrum. The tubes were normal and there were no adhesions. The large cyst was so distended that there was apparently no ovarian tissue left; however, a circular incision was made around the base of the cyst about 2 inches from the pedicle or mesovarium and the tumor enucleated. The tissues thus left retracted immediately and could be seen to contain cortical ovarian structure. This shell of ovarian tissue was then whipped together with fine catgut in such a way that the raw surfaces were turned in and dead space obliterated, the result being a mass of normal-looking ovarian tissue as large or larger than a hazelnut. On the other side the smaller cyst was enucleated, leaving about one-half of the normal ovary. The uterine displacement was corrected by Mayo's modification of the Gilliam operation and the abdomen closed in layers. Convalescence was uneventful, and I delivered this patient of a full-term male child eighteen months after her operation.

CASE II.—Mrs. C. W., referred by Dr. Mitchell, age twenty-seven, married seven years, one child four years old, had four miscarriages all of which were self-induced by the introduction of a soft-rubber catheter into the cervix. Patient was nearly two months' pregnant when on August 12, 1909, she inserted a catheter into the cervix. She had considerable pain and hemorrhage and as she thought aborted August 15. Following this she had chills and fever and became quite ill. When seen by me on the morning of August 27, fifteen days after the introduction of the catheter, her temperature was 104° F., pulse 120; she was suffering intense pain in lower abdomen, especially on left side, and the whole lower abdomen quite sensitive and moderately rigid. On vaginal examination the uterus was found fixed and masses filled both sides of the pelvis, that on the left side extending well up above the pubic bone. On opening the abdomen all of the pelvic viscera were glued up in adhesions. The left tube was as large as the wrist and filled

with pus from the cornua to the fimbriated extremity. The left ovary was several times its normal size and contained about an ounce of pus. The right tube was adherent to the ovary and in its outer two-thirds was larger than the thumb and contained pus; the inner one-third was thickened as a result of the inflammatory process but contained no pus. The left tube was removed *in toto* up to the uterine cornua and the abscess in the left ovary was drained and the sac cureted. The right tube was amputated at the junction of the inner one-third with the outer two-thirds and the adherent fimbriated extremity was dissected off of the ovary. The end of the remaining part of the tube was split open on its upper aspect for about one-third of an inch and the mucous membrane stitched to the peritoneum with fine interrupted catgut.

The upper border of the broad ligament was then sutured so as to cover raw surface and to leave the right ovary and the end of the amputated tube in close relationship. Raw surfaces were covered as well as possible and the incision closed, leaving a cigaret drain in the lower angle which extended down to the bottom of the culdesac. This was done because of the abscess in the left ovary and because in separating the right tube from the ovary it was impossible to prevent some leakage of pus. Temperature and pulse both dropped after the operation and the convalescence was uneventful, the patient leaving the hospital September 14, just eighteen days after the operation, with drainage practically closed. This patient menstruated last on December 15, 1909, not quite four months after her operation and has up to the present time pursued a perfectly normal course of pregnancy. When seen last ten days ago the fetal heart was 132 and the fetus occupied the vertex position with the occiput to the left, anterior.

CONCLUSIONS.

First.—No woman under forty years old should have all of both ovaries removed except in the presence of tuberculosis or cancer.

Second.—Resection or amputation of diseased parts and plastic work on the tubes will occasionally be followed by conception.

Third.—Even in the presence of infection and more or less involvement of both tubes and ovaries plastic work, followed by pelvic drainage and the Fowler position, may be followed by regeneration.

Fourth.—Radical or sacrificial surgery and conservative or conservation surgery have about the same mortality but a vastly different morbidity.

Fifth.—A very occasional secondary operation may become necessary which might have been avoided by doing radical work.

ADVANCES IN THE PATHOLOGY OF GYNECOLOGY
AND OBSTETRICS.*

BY

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As in other branches of medicine, noteworthy advances in our pathological knowledge of late years have been largely the result of experimental work. In spite of this fact the purely casuistic literature has shown little tendency to diminish in volume, and consequently any attempt to review, even briefly, the enormous number of articles which have appeared in the last few years would prove futile. I shall be extremely eclectic in my choice, but hope that at least some of the topics on which I shall dwell will prove of interest to you.

Every practical gynecologist will have noted the discrepancies between pathological reports of cureting and the clinical findings. The work of Hitchmann and Adler(1) first threw some light upon this obscure subject. These authors announced that almost all the endometrial changes hitherto reported as acute endometritis or chronic glandular or chronic hyperplastic endometritis are physiological and dependent upon changes regularly occurring with each menstrual cycle. They divide the monthly cycle into four phases. The first phase, the *post-menstruum*, corresponds to the picture of the normal endometrium of our text-books. The glands are small and regular, round in cross-section. The epithelium is narrow, the oval nuclei large in proportion to the cell body, and the stroma is densely packed and round or spindle-celled in type. During the *interval*, as they denominate the second phase, the glands assume cork-screw shape, the epithelium growing higher and containing more protoplasm. In the third stage called by them the *premenstruum*, the mucous membrane which is now thick and velvety, can be divided into a superficial, compact, and deeper, spongy layer. The glands assume irregular convoluted shapes, their epithelial layer is thrown into folds and wedge-shaped feathery projections. The lumen is filled with secretion. The stroma cells become large, their cell body grows visible, and in general these cells assume the

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type of decidual cells. As soon as the final phase, or *menstruation*, begins the engorgement gradually disappears. Blood cells are noted on the surface and in the stroma. Gebhard's(2) conception of the superficial layers being lifted up by the extravasated blood is of rare occurrence. By the time menstruation is over, the postmenstrual appearance of the mucosa again predominates.

Hitchmann and Adler propose that we modify our former conception of endometritis for, according to their views, plasma cells must be demonstrated before an inflammatory process can be assumed. Unfortunately, in practice, these four stages do not usually occur in such a hard and fast manner. Single sections, in which areas conforming to two or more of the above phases appear, are common, and plasma cells have not been found a safe guide by most pathologists(3). However, the work of these authors has greatly clarified the interpretation of curetings. Normal endometria have become the rule and not the exception in examinations of uterine scrapings.

Applying these facts to our clinical conception of endometritis, it appears to me justified to classify this disease into acute bacterial infections (of which we are rarely in a position to obtain specimens, and even more rarely called to report upon), and fungoid endometritis, in which such an exaggerated hyperplasia, often polypoid in character, is met with, that it cannot be made to conform with the accepted cyclical changes.

The clinical symptoms of leukorrhea or menorrhagia or metrorrhagia, usually ascribed to endometrial changes, are but rarely accompanied by distinct and classifiable alterations in the mucous membrane. Most probably further research will show that the uterine musculature, as in chronic metritis, (Theilhaber(4), Anspach(5)), the uterine vessels (arteriosclerosis)(6), ovarian(7), or systemic disease(8), are at fault.

As experimental methods of investigation do not seem applicable to this subject, our hope of gaining further insight into this puzzling and important field is, at present, not bright. Indirectly; however, our knowledge of uterine changes, depending upon ovarian function, has been greatly enriched.

One method of studying ovarian function in its simplest forms is by transplantation of these organs. Transplantation of the ovaries has been practised successfully both upon animals and human beings (Cramer(9), Morris,(10) Martin,(11) etc.). The technical difficulties are considerable, the possible sources of

error or misinterpretation, particularly in the human subject, are great. Success of the transplantation is shown by the return of menstruation in castrates, or by subsequent conception. To emphasize with what reserve successful results should be received I will instance a case recently published in another connection. Maits(12) at Hirst's clinic was treating cases of artificial menopause by subcutaneous injections of human corpus luteum. These patients were of course selected because both ovaries had been removed. Nevertheless, one patient became pregnant four months after operation while under treatment, some portion of the ovary having been overlooked at operation. It is particularly difficult to avoid accidentally leaving behind some small portion of the ovary in inflammatory cases, and accessory ovaries are not extremely uncommon.

The corpus luteum or yellow body which is periodically formed from the epithelial remains of the ruptured Graafian follicle has long proved an enigma to all. Our views of the function of this gland must be completely revised. Fraenkel(13) stated that this transitory body—undoubtedly a gland of internal secretion—caused rut and menstruation, and that it produced hyperemia and softening of the uterine tissues in order to furnish a suitable nidus for the fertilized ovum. His views, however, did not receive confirmation.

Loeb(14), by a beautiful and extensive series of experiments, has placed our knowledge upon a solid basis. His experiments demonstrate that in the guinea-pig and rabbit, at any time within two to nine days after the rupture of the Graafian follicle, the uterine mucosa reacts to traumatic stimuli in a peculiar fashion. During this period incisions into the uterus or insertion into the lumen of an indifferent foreign body produces an enormous proliferation of the stroma cells. This proliferation causes the development of tumor-like formations which persist for about ten days and then disappear by necrosis. As the component cells are identical with the decidua cells of the animal, Loeb calls these transitory tumors deciduomata. If the ovaries have been removed, or the corpora lutea are ablated, no such formations develop. Furthermore, parts of the uterus transplanted to other parts of the animal show the same changes, though to a minor degree. These experiments show that the corpus luteum inaugurates the tumor formation, and that the substance it elaborates is carried to the uterus through the blood stream. The significance of these phenomena is evident. The

irritation physiologically exercised by the fertilized ovum produces a similar reaction during pregnancy, and the uterus, thereupon responds by the formation of the decidua which enables the ovum to become fixed. Loeb also showed that certain changes regularly occur in the surface epithelium of the mucosa at a certain period of the sexual cycle, and that these changes are dependent upon the presence of the corpus luteum. It appears to be beyond question that the changes noted in the human uterus by Hitchman and Adler, previously referred to, are likewise due to the influence of the corpus luteum.

In his most recent communication Loeb(15) announces another function of the corpus luteum, by means of which it prolongs the sexual cycle. As long as the corpus luteum persists other follicles are prevented from rupturing. Instead of rupturing they become atretic. As soon as the yellow body degenerates, or if it be artificially removed, other ripe follicles rupture and in turn form corpora lutea. During part of pregnancy the corpus luteum regularly persists and consequently ovulation ceases during this period. Briefly summed up, these researches have shown exactly how the maternal part of the placenta, which is necessary for nidation, is formed in response to the influence of the yellow body, and why early removal of the ovary may prevent pregnancy. The corpus luteum also regulates the sexual cycle by inhibiting ovulation.

It has been generally accepted that the ovary exercised considerable influence on the body metabolism, and that castration markedly reduced oxidative processes as shown by the accumulation of fat. MacCrudden(16) has recently performed very careful metabolism experiments on male and female dogs, observing their metabolism before and after castration. His research proves that no such influence is exerted by removal of the sexual gland. His work in osteomalacia(17) likewise shows that castration does not cause a retention of organic or inorganic salts above normal. If castration produces a cure or improvement in this disease, the change for the better may be due indirectly to the interaction of the ovary on other glands of internal secretion. MacCallum and Voegtlin(18) have not only confirmed the view that tetany is due to removal of the parathyroid glandules, but also have shown that in this condition enormous amounts of calcium are excreted. As loss of calcium is one of the chief symptoms of osteomalacia, parathyroid insufficiency may be an etiological factor, and castration may prove curative by

reestablishing a disturbed balance of function between parathyroid and other glands of internal secretion. That this assumption is not purely fanciful is made likely by the many evidences of similar interaction. In acromegaly(19), usually due to hypertrophy of the pituitary body, hypoplasia of the female generative organs is the rule. During pregnancy—in which the corpus luteum persists—the hypophysis enlarges and its cells show well marked-changes(20). Cases of tumors of the adrenal glands(21), in which the secondary female sex characteristics have become neutral or male in type, are reported. Our knowledge in this field is still in its infancy.

Before leaving the discussion of the ovary I would like to call attention to the subject of ovarian therapy. By experimental methods some authors have claimed to prove that ovarian extract has a powerful vasomotor and a toxic effect(22). Others have claimed that injections of ovarian or lutein influences metabolism in various ways(23). In my opinion errors in experimentation account for many of these deductions. On the other hand, clinical observations should be accepted with the utmost reserve as long as our clinical data are limited to the vague vasomotor disturbances of the natural or artificial menopause or to the menstrual phenomena of women with already irregular menstruation. In the light of Loeb's discoveries injection of ovarian extract, if we succeed in obtaining an effective drug, should *prevent* the occurrence of menstruation. From my own experimental work(24), I am inclined to assume a strictly agnostic standpoint in regard to the value of oovotherapy as now practised.

Turning now to other subjects, lack of time will permit only of the briefest treatment.

The frequent discussion, dealing with the advisability of permitting postoperative and puerperal patients to rise early from bed has naturally stimulated research which might throw further light upon the subject of aseptic thrombosis. Of these papers I shall mention only one—that of Zurhelle(25)—who concludes that aseptic intravascular clotting is primarily due to adherence of the white blood plates to the vessel wall (agglutination) and that fibrin formation is consequent and secondary. A rapid and powerful circulation hinders thrombosis, as the platlets are then forced to move in the center of the blood stream. According to this author, anticoagulating substances are useless as a prophylactic, but antiagglutinating ones, if we had them

at our command, should prove effective. This subject, however, is by no means exhausted. The research in question would speak in favor of early rising, which increases circulatory activity, though clinicians are as yet divided in their views.

Of still greater importance are studies of bacterial blood infections, especially those occurring during the puerperium. Fromme(26) has published two methods by means of which he claims to distinguish pathogenic from nonpathogenic streptococci. Not only are not all streptococci pathogenic, but even the hemolytic groups vary in this respect. Suffice it to state that neither by means of lecithin bouillon or by the so-called "blood sponge" (an emulsion of red blood-corpuscles) can definite prognostic conclusions of pathogenicity be drawn(27). As, heretofore, some unknown variable factors—perhaps simply the extent of the patients individual resistance—come into play.

I shall not attempt to discuss, opsonins vaccines, etc., as this phase of the subject is familiar to all. However, it is of interest to note that, according to laboratory investigations, antistreptococcus serum, as now prepared and used, should and does prove useless. In white mice a dose of 0.1 c.c., given six hours after infection, proved curative. Given twenty-four hours after inoculation, five times this dose could save only one-half the animals. In human beings six hours after infection 200 to 400 c.c. would theoretically be required, with a proportionate increase in quantity and decrease in efficiency as the time after infection is prolonged. In the sera now on the market infinitesimal doses only of opsonins, bacteriotropic substances, or antiaggressins could be demonstrated; never as many phagocytic substances as in a normal puerpera (Heynemann and Barth(28)).

Lack of time will prevent more than mention of the value of blood cultures in puerperal sepsis. Von Bardeleben(29) has shown by experiment, what has long been accepted but not proved, that the less virulent forms of bacteria are the ones which produce thrombophlebitis, the more virulent ones general bacteremias.

No great progress has been made in the study of eclampsia in spite of an immense amount of effort. Just as the strictly chemical theories (Frerich etc.), have become obsolete, Veit's syncytiolytic theory has seen its hey-day. Veit(30), believed that portions of the fetal trophoblast were carried into the maternal circulation, there acting as a toxine. Newer

investigations have proved that the placenta is not toxic in any specific sense, such as Veit assumed (Frank(31), O. Fraenkel(32), Higuchi(33)). Hofbauer(34) believes that ferments, contained in the placenta, cause eclampsia by producing autolytic disintegration of the liver. The newest theory is that of Dienst(35), who believes that thrombotic substances (fibrinogen, etc.) derived from the disintegration of leukocytes (hyperleukocytosis) increase the coagulability of the maternal blood and cause the multiple, capillary thrombi which produce the characteristic postmortem findings in eclampsia. Consequently, Dienst recommends and has used hirudin (leech extract) in the treatment of the disease, as this drug inhibits blood coagulation. We may expect new theories, at short intervals, until some really definite discovery of the true etiology has been made.

A fascinating, but not strictly practical problem, is furnished by the growth of the mammary gland during pregnancy. It has been long known that this striking physiological process is independent of nervous influences(36), but the exact mechanism involved has never been discovered. Halban(37) believes that the placenta causes hypertrophy of the mamma, but that it also serves to inhibit milk secretion. Not until after the expulsion of the placenta do the glands secrete. His deductions are based on clinical observations. Basch(38) has used combined placental and ovarian injections to produce milk secretion. His experiments are unconvincing, as they were performed upon parous animals by means of subcutaneous injections. Starling(39), likewise, claims to have caused, experimentally, growth of the breast tissue by long-continued injections of extract of fetuses. It will be noted how strikingly different results can be obtained in experimental researches by competent investigators.

In closing this brief survey of more recent advances, made by means of laboratory researches in gynecology and obstetrics, no better example of the *practical value* of research methods can be given than clearness with which the causes of Colle's and Profeta's laws have now been explained. Healthy (?) mothers of syphilitic children are supposed to be immune to syphilis, and likewise supposedly healthy children of luetic parents have proven immune. By means of the Wassermann reaction (Knoepfelmacher und Lehndorof(46)), and by demonstrating spirochetes in the maternal portion of the placenta and in the blood of the intervillous spaces (Baisch(41)) it has been shown that this immunity is only apparent, and reinfection is prevented

by the presence of a latent syphilis. Thus the conception of a purely paternal transmission of syphilis must be discarded.

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- 983 PARK AVENUE.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of October 11, 1910.

The President, R. L. DICKINSON, M. D., in the Chair.

DR. C. C. BARROWS presented a specimen of

RUPTURED OVARIAN PREGNANCY.

The patient, a married woman, twenty-five years old, was admitted to Bellevue Hospital on September 26 with the following history: Except for the fact that her menstruation had been irregular for the past eight months, she having menstruated but four times during that period, the patient believed herself to be in good health. She had had no pains, no excessive menstruation, no discharge of clots or membrane—no nausea nor vomiting and so far as she could tell no changes in her breasts.

Her last menstruation which she regarded as normal was six weeks prior to her admission. She states that twenty-four hours before admission, after lifting a heavy tub she was immediately nauseated, vomited profusely, felt weak, had a cold sweat, and fainted. At the same time she felt severe, sudden pain in the lower part of her abdomen, more acute on the right side than on the left. When she revived the pain was still severe and with less severity continued up to the time of her admission to the hospital. She vomited twice between the time the attack came on and the time I saw her, which was at the time of her admission. She feels very weak, has felt feverish, but has had no definite chill. I saw her shortly after admission to Bellevue Hospital. She had a temperature of 101.4°, a pulse of 124 and respiration of 26. Her pulse was soft, easily compressible, and her general aspect

was that of one suffering from internal hemorrhage. The urine was normal; blood showed 4,800,000 red cells when she was admitted, and within two hours afterward while they were preparing her for operation and while I was being gotten, it dropped to 4,300,500; there was a leukocytosis of 18,000 with 90 per cent. polynuclears. Vaginal smear was negative so far as gonococci were concerned.

I expected to find on opening the abdomen a ruptured tubal pregnancy. The abdominal cavity was full of fluid blood, with few clots; the left Fallopian tube and ovary were normal as was also the right tube. Lying below the right tube was the

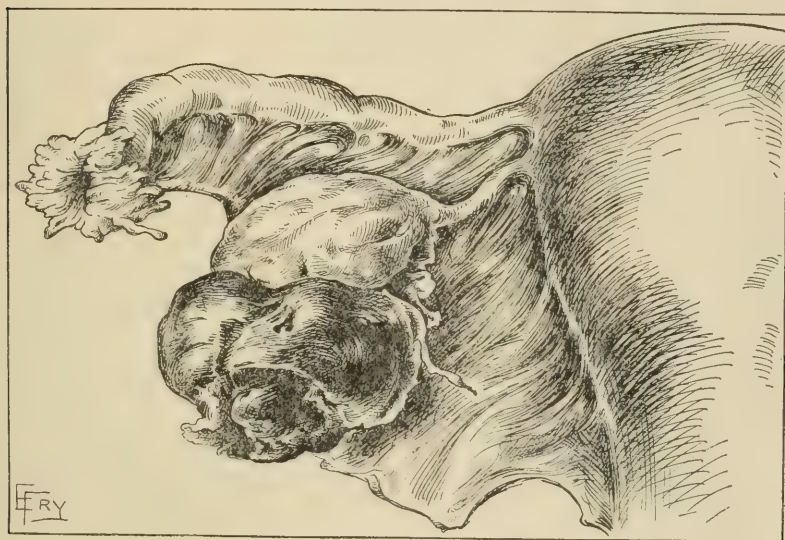


FIG. 1.—Ovarian Pregnancy. (Barrows.)

ovary, the size of a large walnut. There was a rupture of the ovarian wall and protruding from the rupture was a clot. This tube and ovary make up the specimen which I present. It was sent to the Department of Pathology, of Cornell University Medical College and Dr. A. J. Elser sends me the following report:

Specimen No. 3678 consists of a tube and a portion of ovary, also a blood clot which is irregularly spherical in shape about the size of a walnut.

The clot appears to be partially surrounded by a capsule and at one point it shows tissue closely resembling placental structure. The tube is normal in size and appearance.

Microscopical examination reveals numerous chorionic villi.

The capsule surrounding the blood clot shows that it is made up of ovarian structures.

Diagnosis.—Genuine ovarian pregnancy.

DISCUSSION.

DR. CRAGIN.—I only wish to congratulate Dr. Barrows on having a case of true ovarian pregnancy. It has never been my good fortune to meet with one. I would like to suggest to Dr. Barrows, so that he can meet the criticism which is sure to come, that he have photomicrographs and drawings made of this specimen for a permanent record. It certainly seems from what Dr. Barrows reports to conform to the test for an ovarian pregnancy and I would simply suggest that he support his remarks by photographic proofs which will probably be easy for him to obtain.

DR. FLINT.—I never have seen an ovarian pregnancy.

DR. DICKINSON.—They are becoming more common and being confirmed with greater clearness, although still very rare. Webster has reported a number of cases.

DR. FOERSTER.—I have been looking for pregnancies of this sort as sharply as anyone of us and I thought I had found one now and then, but every time I was at fault when it came to the pathological examination. Now in this case, which is based on pathological grounds, we will have to accept the diagnosis. The specimen reminds me of hematoma of the ovary which we see developed in cases of chronic inflammation of the ovaries—one of the corpora lutea undergoing typical changes. Some years ago, while under the guidance of Dr. C. Heitzmann, I looked into this matter thoroughly. At that time I called these bodies endothelioma of the ovary. In later years I used the term persistent corpus luteum of pregnancy occurring in a chronically inflamed ovary. These so-called persistent corpora lutea I have found frequently. They were apparently of the same nature as this specimen here, but microscopically they were distinctly different. Rupture of a hematoma of the ovary may cause considerable hemorrhage but I have not seen such extensive hemorrhage as Dr. B. mentions. I explain the hemorrhage in such cases simply by the sclerotic condition of the vessels in the chronically inflamed ovary.

On the other hand, where the pregnancy is ovarian and we have to deal with an early rupture, an extensive, hemorrhage is rather remarkable. In face of the pathological examination of the specimen of course we would have to say it is an ovarian pregnancy, but otherwise, macroscopically, it is one of the hematomata of which I have seen so many and which usually give rise to an extensive bleeding.

DR. BARROWS.—There was much blood in this abdomen, as much as one would find in a very bad ruptured tubal pregnancy, and when I opened the abdomen I expected to find what I had diagnosed. The first thing that came into view was the tube which was apparently perfectly normal. It did not seem to be enlarged at all. There was no blood being exuded from the open end. There were no adhesions and very few blood clots, only this mass which was the ovary and the clot almost but not



OVARIAN PREGNANCY.—(BARROWS.)

entirely extruded from the opening in the ovary. It has been stitched in the original position in the mounted specimen. A segment has been removed from one side of the clot and wall for examination.

DR. H. C. COE presented a specimen of

DERMOID CYST OF THE OVARY AND TUBAL PREGNANCY.

Mrs. H., aged thirty, married ten years, no children; one abortion at four months soon after marriage. She skipped her August period, but supposed that this was due to cold and exposure while in camp. There was a slight "show" accompanied with cramps. The same phenomena were noted at the time of the September period. She had had a persistent bloody discharge for two weeks. Ten days before the speaker saw her (September 13) she had two attacks of abdominal pain with the passage of clots. While straining at stool she had a third attack, with a peculiar "cold" sensation in the abdomen, the pain being localized in the left side.

She called a physician into diagnosed ruptured ectopic, the diagnosis being confirmed by Dr. Coe, who urged an early operation. At this time the patient's pulse and temperature were normal and there was general tenderness over the abdomen, most marked in the left lower quadrant. On vaginal examination an indefinite mass was palpated behind the left broad ligament. The patient was removed to the hospital without delay, where she had another severe attack of pain, but without evidences of internal hemorrhage. Patient well nourished and with rosy cheeks.

Operation.—The abdomen was filled with fluid blood and recent clots. The mass consisted of a dermoid cyst the size of a golf ball and a ruptured ectopic slight adhesion. There was no trace of ovarian tissue in the cyst. Right tube and ovary normal. Time of operation twenty minutes. The patient's pulse was not affected either during or after the operation and her convalescence was so rapid that she sat up on the tenth day and went out to drive on the fourteenth.

Dr. Coe stated that he had reported this typical case, not merely to illustrate the fact that one should not be deceived as to the existence of active hemorrhage by the appearance of the patient, but to raise the interesting question of impregnation by external or internal crossing of the ovum. As the left ovary was entirely destroyed there seemed to be no other way in which to explain the occurrence of pregnancy in the corresponding tube.

DISCUSSION.

DR. WALDO.—Dr. Coe brought up the idea of the possibility of impregnation taking place across or through the uterus. I had a very curious case where I took away the ovary on one side and left the tube. On the other side I removed the tube and

left the ovary. That woman afterward became pregnant and gave birth to a child.

DR. CRAGIN.—It seems to me that cases of external migration of the ovum must be comparatively frequent. Dr. Kelly reports a similar case to that reported by Dr. Waldo and several years ago Dr. Coe reported a case where the remains of an ectopic gestation obstructed the lumen of the tube on one side and later another ectopic gestation was found in the outer end of that same tube. I remember removing a dermoid cyst of the left ovary and afterward operating on a tubal pregnancy on the same side. This ovum had migrated, having come from the opposite ovary. There are a number of such cases in the literature. Most men think it is external rather than internal migration.

DR. VINEBERG.—A couple of years ago I saw a similar case to that of Dr. Coe's, except there was no escape of blood into the peritoneal cavity. On opening the abdomen, I found a cyst about the size of a hen's egg, and I was about giving up the diagnosis and looking upon the case as an error of diagnosis when the house surgeon on examining the specimen closely found an exceedingly small fetus in the tube on the same side.

A case I reported later in which the pregnancy had occurred in the stump of a tube that had been operated on a year before by Dr. Kellogg (?) removing a pyosalpinx and ovary on that side and the pregnancy had occurred in the small end of the tube left. In that case there must have been a migration of the ovum.

DR. CLEMENT CLEVELAND presented an

IMPROVED NEEDLE AND FORCEPS.

Twenty years ago I thought I needed a needle that would not twist. I had some made at the time. They were not made satisfactorily for me and I abandoned the idea. Last year, being bothered some by the twisting of needles, I got Tiemann to make some needles on the plan of some of the old ones. The shaft is quadrangular, and this forceps, the Richter's (?), holds it very well. I have found it of some use because it does not twist in going through a hard cervix. It works very well in Richter's forceps. There are two sample needles here. Tiemann makes them of all shapes and sizes, sharp and round-pointed. I had another pair of forceps made that comes to match the needles. On either blade of the forceps there are sunken "V" cuts. The needles will not twist in them. They are of some use, but not of course of extensive advantage.

The papers for the evening were read on

PROGRESS OF THE YEAR IN

(a) GYNECOLOGY, DR. BRICKNER.*

(b) OBSTETRICS, DR. BRODHEAD.†

(c) PATHOLOGY, DR. FRANK.‡

* For original article, see page 1027.

† For original article, see page 1037.

‡ For original article, see page. 1070.

DISCUSSION.

DR. DICKINSON.—I hope other members have been as much instructed as the President has. These papers represent a large amount of arduous work, and nothing calls for more wit and judgment than condensation and selection.

DR. BARROWS.—I was particularly interested in that part of Dr. Brickner's paper which I had the good fortune to hear. Unfortunately I was called out and only heard part of his paper, and that was the part which referred to the treatment of intramural accumulations of pus in the uterus. I have been studying this condition with much interest during the past year and I have six cases in which I have opened abscesses within the wall of the uterus itself and treated them by drainage and at the same time have had prepared a vaccine from the pus which was contained within these pus cavities, which autogenous vaccine has been emphasized in each case. All of the cases have apparently recovered completely. The most recent is of about four months' duration, so that I think I can truthfully say they have all recovered. These were cases in which there was no involvement of the tubes and ovaries at all. They were simply infections of the uterine wall and accumulations of pus within the uterine wall, and as I remember in four out of the six cases the pus cavity was in the anterior portion of the uterus. Drainage was made from above. The abdomen was opened and drainage was established from above, to my mind the most successful method of drainage in cases of that sort. At the same time the vaccines were made and administered under the direction of the pathological department of Cornell University Medical College. These cases have all done so well that I am about ready to report them and hope to do so within a short time.

DR. MABBOTT.—It has occurred to me that one matter in Dr. Brodhead's paper stands out perhaps as being of very great practical importance and that is the recent use of human blood serum in the treatment of hemorrhages of the new-born. I think that this is a very valuable addition to our therapeutic resources and we shall have better results hereafter in dealing with these cases. I have in mind one case in private practice, a breech delivery in which I was in charge of the case and in which very efficient pressure from above was rendered by a colleague. The baby survived, and being rather small, a little under 6 pounds, one would think perhaps need not have been injured. And we were not aware that it had been injured. But during the following twenty-four hours there was an increasing distention of the fontanels of the head and the child developed a condition of muscular rigidity, in fact a form of spasm. We had consultation with Dr. Kerley and Dr. Haynes and were fortunate in being able to avail ourselves of the services of Dr. J. E. Welch. We drew off some cerebrospinal fluid from the canal and the bacteriologist reported that his examination found it to be nothing but pure blood. The tension of the head was greatly

relieved by the removal of the small quantity of fluid but increased again within a few minutes, apparently indicating a continuence or renewal of the hemorrhage. The case was treated by the injection subcutaneously of human blood serum, the child recovered quite rapidly and is now three and one-half months old and above the average weight, about 15 pounds, whereas 13 pounds is about the normal weight.

DR. CRAGIN.—In connection with the use of human serum in these hemorrhages of the new-born, I would like to call your attention to the use of rabbit serum in this condition. At the Sloane Hospital we have been using rabbit serum in place of human and it seems to do almost, if not quite, as well as the human serum.

It is still in the experimental stage, but our plan has been to use the serum that we could get from one rabbit, which will vary from 10 to 20 c.c., and give an injection of that each day for two or three days. As I say, it is still in the experimental stage, but the recoveries have been very satisfactory and although I am not prepared to say that it is as good as human serum, it has been apparently very efficient and we are still going on with the matter.

The rabbit is placed on a warm stage and is bled to death from the carotid artery. The serum is then separated from this blood and injected subcutaneously.

DR. FLINT.—I was very much interested in reading the original paper of Dr. Welch in regard to the use of human serum in the treatment of hemophilia. In it I think that he refers to the use of horse serum and ordinary diphtheria antitoxin as producing the same kind of improvement. Some years ago I used large doses of diphtheria antitoxin in the case of a child who had persistent bleeding from the gums and succeeded in stopping the hemorrhage. More recent experience and experiments have shown that while these sera will stop hemorrhage, they have certain unfavorable symptoms which counterindicate their general use. For this reason Dr. Welch has used the human serum, although the serum of any animal, including that of the horse, seem to produce immediate results that are just as good.

DR. CRAGIN.—It was on account of the benefit derived from horse's serum in certain cases and the objections to its use, that we were led to employ the rabbit serum. Thus far we have met with no disagreeable results.

DR. W. G. WYLIE recalled a case of purpura in a small child successfully treated by the injections of large quantities of human blood serum.

DR. JARMAN.—Some few men know I have always been at heart more or less of a farmer. When the last paper was being read a little incident came to my mind which would refute entirely the theory of the placenta having anything to do with inhibiting the milk supply until after the placenta had been delivered. I have a friend who is an excellent senator, who has a beautiful plantation and raises a great many Jersey cattle. He had a little girl

at the time about eight or nine years old and a heifer calf was born. He gave the calf to this young child and she, in imitation of an old servant on the place, began to milk the calf. When this calf was six and one-half months old, it was exhibited at the county fair by this little girl gotten up as a fantastic Dutch milk maid, while before the calf they carried a little platter of butter, about the size of an ordinary bread and butter plate and a little pitcher of milk. A number of people examined the calf and the udder was well developed; then the little girl sat down and proceeded to milk the calf.

That calf certainly had never had a chance to develop a placenta to permit the milk to be formed. Evidently the purely mechanical action on the calf of the little girl attempting to milk it had an effect until it finally began to give milk,

DR. COE.—I am deeply interested in the subject of ootherapy because I, like the writer, have always been skeptical as to the practical value of the various extracts. I have noted especially this therapeutic action in cases of climacteric disturbances, and now limit myself to the use of reliable corpus luteum extract. Certainly the results in a series of cases have been quite striking, as one patient has been almost entirely relieved of the ordinary menopause vasomotor phenomena so that I am inclined to believe that the corpus luteum is really the most important body in the ovary, not only physiologically, but pathologically. We have a great deal still to learn, but it seems as if this were a profitable line of investigation.

DR. W. G. WYLIE.—It has been very interesting to me to note how these papers have brought out to-night the fact that gynecology has broadened and has changed very much in the last few years. It makes it plain that gynecology cannot be separated from obstetrics and that there is something more in gynecology than surgery. There is no doubt that gynecology was injured by concentrating too much upon special surgery and by not giving enough attention to its clinical side.

DR. BRICKNER.—I only want to say that those who are interested in the progress of gynecology are referred to a charming essay by Dr. Coe "The Old and New Gynecology," published last summer in the *Dominion Medical Monthly*. One does not often find a medical essay of such literary value, and which is interesting and instructive besides. You will find it well worth perusal.

REVIEWS.

A MANUAL OF MIDWIFERY; FOR STUDENTS AND PRACTITIONERS.
 BY HENRY JELLETT, B. A., M. D. (Dub. Univ.), F. R. C. P. I.,
 L. M. King's Professor of Midwifery in the School of Physic,
 Trinity College, Dublin; Gynecologist to Sir Patrick Dun's
 Hospital; etc., etc., with the assistance in special subjects of
 W. R. DAWSON, M. D., F. R. C. P. I., Medical Superintendent,
 Farnham House, Dublin, etc.; H. C. DRURY, M. D., F. R.
 C. P. I., Physician to Sir Patrick Dun's Hospital, etc.; T. G.
 MOORHEAD, M. D., F. R. C. P. I., Physician to the Royal City
 of Dublin Hospital, etc.; and R. J. RAWLETTE, M. D., Path-
 ologist to the Rotunda Hospital. Octavo, 1210 pages, second
 edition with 17 plates and 557 illustrations in the text. New
 York, William Wood and Co., 1910.

The labors of the long line of masters of the Rotunda Hospital constitutes an estimable chapter in the history of obstetrics, and a work which embodies the teachings and practice of this school commands the profoundest consideration.

It may be said at the outset that the volume, with few exceptions, fulfils expectations and classes with the best text-books of obstetrics extant. The voluminous character of the work enables an unusually full exposition of the subject. The value of an acquaintance with medical history is recognized by the introduction of prefatory historical summaries. Pathology and bacteriology receive their due. On debatable topics, the different views are succinctly summarized. The literature of obstetrics is called upon abundantly; the references are wide, representative, and cosmopolitan, and form one of the most valuable features of the book.

As in most text-books on obstetrics, the first chapter concerns anatomy, maternal and ovular. The section on placentation and the early development of the ovum shows a thorough acquaintance with the classical work of Peters, von Spee, Tocher, and Poryce, etc. The succeeding chapters on asepsis, diagnosis, and the physiology of pregnancy and of labor deal with these subjects along orthodox lines. The work of Döderlein on the bacteriology of the genital tract is given full credit and the preliminary vaginal douche is deprecated. The various presentations and their management are discussed clearly and with sufficient detail to satisfy the most exacting. In the discussion of diseases of the decidua the author still holds to the old classification of "atrophic" and "hypertrophic" endometritis, and appears to

be unacquainted with the now accepted work of Hintchman and Adler, who have shown that these terms, histologically at least, merely represent stages in the menstrual cycle. On the other hand, the pathology of cystic mole and of chorioepithelioma bears a thoroughly modern flavor. The author indicates the tread of modern thought by including acute yellow atrophy, hyperemesis gravidarum, and eclampsia under the heading of "Toxemias of Pregnancy," even though he is not convinced that these maladies are evidences of one and the same disorder. The chemistry of toxemia of pregnancy, especially the work of American authors is briefly sketched, but no opinion is afforded as to the value of the nitrogen and ammonia coefficient for the diagnosis of the pre-eclamptic stage. No mention is made of the glucose injection treatment of eclampsia.

In the chapter on extrauterine pregnancy, it is gratifying to note that the pathological anatomy is not lightly passed over as in most text-books. A knowledge of the histogenesis is important in the proper understanding of many of its clinical phases. The author is a strong advocate of immediate operation. The various forms of contracted pelvis are discussed in three chapters. The chapter on postpartum sepsis is well written. The development of the modern conception of sepsis is traced in an interesting style from ancient times to the work of Holmes, Semmelweis, Sister, and Pasteur.

The bacteriology of sepsis is treated scientifically—a feat not usual in text-books on obstetrics. The various methods of treatment are critically discussed. No opinion is expressed as to the value of vaccines and the author is sceptical as to the value of ligation of the pelvic veins.

Obstetric operations are discussed in five chapters. The author quotes Hammerschlag in regard to the indications and value of Bossi's dilator. Many methods of inducing abortion are given, but no preference is indicated. Apparently, also, the author has had no experience with vaginal Cesarean section of Dührssen, pubiotomy or the scopolamin-morphin method of analgesia. The final chapters concern infant feeding and the pathology of the infant; that on infant feeding is altogether inadequate.

The illustrations are well executed and those that have been borrowed have been selected with judgment. Although the work contains over 1200 pages, the volume is not as large as one might expect. This is due to the thin paper and the compactness of the printing. The index is full.

The one criticism that may be directed toward the work is the lack of definite opinions concerning matters over which opinion has not as yet crystallized. We have indicated some of these matters in the above review.

The perusal of this book has afforded us much pleasure and we recommend it cordially.

E. M.

A TEXT-BOOK OF THE PRINCIPLES OF ANIMAL HISTOLOGY. By ULRIC DAHLGREN, M. S., Assistant Professor of Biology in Princeton University, and WILLIAM A. KEPPNER, A. B., Adjunct Professor of Biology in the University of Virginia. Pp. 515, 470 illustrations. New York, The Macmillan Co., 1908.

Nothing can be more inspiring than to place a book like this in the hands of the young man about to study medicine, and he must have a dull spirit, indeed, who would not be stimulated by it to look further and with eagerness into that land of pure delight of which this affords him a glimpse.

Radically different in its conception and planning from previous works on histology, this teaches general principles and pictures histology as a pure science and for its own sake. It shows what the animal cell is capable of as a builder of tissues that enable the organism to make use of nearly all the known forces of physics and many of those of chemistry. It shows in what manner the tissues produce light, gases, electricity, and many other things not even hinted at in the ordinary medical text-book. It shows how delicate forms of touch have been employed to enable the organism to determine its position with regard to gravity or successive positions in space, or, by still more delicate mechanism, to perceive the atmospheric vibrations known as sound. The tissues of light perception are traced from the simple pigmented cell to the most perfect eye forms; and in the same way are treated all the other known functions of cells.

The chapters are arranged on a basis of *function* in the first place, with ontogenetic and a possibly phylogenetic origin in the second place, its authors believing that such a direct treatment is not only more conservative and clear, but that it is more logical and true, and that it will serve the better to correlate the students' conceptions concerning homology and analogy and kindred relationships. The great value of teaching the subject from the point of view of function can be better appreciated when the fact is recalled that all structures exist only for the purpose of performing certain functions in some particular way.

The book does not claim to stand as an authority or court of last resort for the specialist in matters of general histology. In most cases it does not carry the student into debated ground. It does attempt to be a convenient teaching guide, to gain the interest of its readers and to stimulate original thought, and in this we feel that it is most successful.

NEPHROCOLOPTOSIS. By W. H. LONGYEAR, M. D. Professor of Gynecology and Abdominal Surgery, Detroit Post-Graduate Medical School; Clinical Professor of Gynecology, Detroit College of Medicine; Gynecologist to Harper Hospital; Consulting Obstetrician to the Woman's Hospital; Ex-president

of the American Association of Obstetricians and Gynecologists. Pp. 250, with 88 illustrations and a colored frontispiece. St. Louis, C. V. Mosby Co., 1910.

This work contains a description of the nephrocolic ligament, first recognized and described by Dr. Longyear, an explanation of its action in the causation of nephroptosis and the technic of the operation of nephrocolopexy in which the ligament is utilized to immobilize both kidney and bowel.

The book is well illustrated and well printed; the style is simple and the descriptions clear. The first chapter goes minutely into the anatomy of the ligament and of the conditions described; the second discusses the etiology, laying special stress on hereditary weakness of restraining tissues as a primary cause of ptosis of internal organs; the third goes into symptomatology; the fourth into diagnosis; the fifth into treatment, in which the author's operation is minutely detailed; while the sixth reports briefly some fifty cases in which the operation has been done.

The book is a record of original work, is valuable, and should be read by all those interested in this very common and important condition.

MEDICAL RECORD VISITING LIST, or Physician's Diary for 1911.

New Revised Edition. New York, Wm. Wood and Co.

This well-known and long-established favorite appears in its usual dress of flexible red or black morocco leather. It is printed on very thin, fine paper so as to be easily carried in the pocket. It is arranged for thirty, sixty, or ninety patients a week, and with or without dates. For those desiring an especially elegant list, genuine seal or calf-skin wallets are furnished, in which the lists proper, made up in books for six months each, can be slipped. Prices are from \$1.25 to \$4.00.

Its contents include—besides a calendar, tables of weights, measures and dosage and other useful information—a visiting list with special memoranda, consultations, obstetric engagements, and practice, vaccinations, deaths, addresses of nurses and patients, and cash accounts.

SURGICAL AFTER-TREATMENT. A Manual of the Conduct of Surgical Convalescence. By L. R. G. CRANDON, A. M., M. S. Assistant in Surgery at the Harvard Medical School. W. B. Saunders Co., Philadelphia, 1910.

This work should be of special value to the house surgeon of a hospital who is called to meet and anticipate a multitude of emergencies in the course of his work. The general practitioner, who is not in touch with the large surgical centers should also derive much benefit.

The book is very complete and the author affords a full survey of various methods of postoperative therapy now in vogue. The rationale of each is given and his criticism is in all instances thoroughly sound. Inasmuch as all hospitals have their "tra-

ditional therapy," the author outlines a practical course of post-operative management, based upon his own preferences.

With the exception of few omissions, the author is thoroughly up to date. The use of iodine, according to the method of Brassich, for disinfection of the skin is not mentioned. This is, perhaps, the most important omission. In the preparation of the bowels, we believe that the author lays too much stress upon the importance of routine anteoperative catharsis. If the bowels have moved thoroughly the day before, we believe it is unnecessary to subject the patient to an extra purge, except, of course, for abdominal operations.

A chapter on Vaccine Therapy and Therapeutic Immunization, by Dr. George P. Sanborn, a former pupil of Wright, has been added. There is also a useful appendix on Food Recipes.

The illustrations are abundant and with few exceptions well chosen.

I. C. R.

EDUCATION IN SEXUAL PHYSIOLOGY AND HYGIENE. A Physician's Message. By PHILIP ZENNER, Professor of Neurology, Medical Department, Univ. Cincinnati. The Robert Clarke Co., 1910.

This little book, crude perhaps from a scientific point of view, is nevertheless commendable as an elementary book for the use of teachers and parents on matters concerning sexual physiology and hygiene. In view of the hitherto total neglect on the part of school authorities to educate children approaching puberty on questions generally regarded as "too delicate," the book must be considered in the light of an experiment. Several talks are given to college boys and school boys, as an example of the kind of teaching which the author regards as available.

I. C. R.

KLINISCHE UND ANATOMISCHE BEITRÄGE ZUR LEHRE VON UTERUSMYOM. Von Dr. Med. ANTON GARKISCH, I Assistant der Klinik mit 22 Abbildungen in Text. S. Karger, Berlin, 1910.

The study is based upon the observations of 601 cases of uterine myoma treated at the Universitäts Frauenklinik of Prague during a period of eight years. The author does not believe in operating uterine myomata simply because these may have grown to a point above the umbilicus, nor merely for such symptoms as hemorrhage, pain or pressure. The mode of the operation, abdominal or vaginal, radical or conservative, depends, in the authors' opinion, upon the size, situation and complications. The abdominal operation is indicated in: 1. patients under forty years, who are anxious to bear children, and 2, in pediculated subserous myomata or solitary interstitial "fibroids" which can be removed without entering the uterine cavity. The *radical* vaginal method was employed in cases

where the tumor has not reached a size which would not permit its removal through the true pelvis. The contraindications to this method were: 1. suspicion of malignancy; 2. inflammatory changes of the adnexa which may be bound by adhesions to intestines; 3. large myomata. The *conservative* vaginal operation was indicated chiefly in submucous myoma, and in interstitial myomata which are not too far removed from the mucosa. The mortality of the vaginal extirpations of the uterus was 5.8 per cent.

Of 192 patients in whom the abdominal and radical myoma extirpation was practised twenty-one had slight symptoms of a disturbed internal ovarian secretion while thirty-one had severer symptoms. The changes were however more apparent in younger patients than in those near the natural period of menopause. The removal of the ovaries with the uterus in women over forty years had slight effect as compared to the disturbances observed in younger individuals. In general the extirpation of the ovaries in the radical myoma operation resulted in an improvement of the health and the working capacity of the patients as against the incapacity that might be expected from castration.

In the histological portion of the monograph nothing new is developed. The author, however, drawn attention to the occurrence of sarcoma developing from the uterine mucosa. This form of sarcoma is to be distinguished from a submucous myoma which has undergone sarcomatous degeneration.

I. C. R.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Chronic Obstetrical Inversion of the Uterus Treated by Posterior Colpohysterectomy.—Blanc and Wies (*Gaz. de gyn.*, Aug. 15, and Sept. 1, 1910) give histories of two cases of chronic obstetrical inversion of the uterus treated by posterior colpohysterectomy in one of which death resulted, in the other recovery. When uterine inversion is chronic and irreducible operation becomes necessary to avert infection. Posterior colpohysterectomy after careful disinfection is the operation to be preferred in old women. In younger women, hysterectomy by the extravaginal method of Pinard is to be preferred.

Case of Pernicious Anemia in Pregnancy.—Audebert and Dalous (*Ann. de gyn. et d'Obst.*, Aug, 1910) describe a case of severe anemia, relieved by the birth of a dead child. The patient was in her third pregnancy. She was so weak as to be incapable of any effort. Anorexia, epigastric burning and vomiting prevented her taking nourishment. She had tachycardia and albuminuria. The blood showed diminution of red cells, slight leukocytosis, myeloblasts, low color-index, rapid coagulation,

and hematoblasts. The fetus was expelled dead at term. The patient seemed to be relieved from some poison or bad influence, and at once began to feel better. In two weeks she left the hospital to go home.

Anatomical and Clinical Study of Anomalies of Number of the Human Placenta.—A. Bonnet-Labordière (*Jour. des sci. med. de Lille*, Sept. 17 and 24, 1910) gives us a study of the anomalies of number of the human placenta based on the observation of two cases and his investigations of literature. The number and shape of the placentas varies considerably, from two to five. In early intrauterine life the villi cover the membranes, while later they atrophy, except at one spot, where they form a round placenta. If there be a failure of atrophy at any point, accessory cotyledons form, each with its own artery and vein. These placentas are bi-discoidal or poly-discoidal. Out of 6,701 labors this anomaly was found in nineteen cases. In another statistical report, out of 9359 labors fifteen yielded placentas abnormal in this respect. In the author's cases one had a previous endometritis, the other albuminuria and a premature dead fetus. The ovum fastening itself on a diseased endometrium develops abnormally. The complications that arise from this anomaly are insertion of one lobe low down in the uterus, perhaps over the os, and tearing of the abnormal vessels when the membranes rupture. Again, one of the accessory cotyledons may be left behind in the uterus after delivery. This generally results from attempts at delivery of the placenta by pulling on the membranes, which causes the cotyledon to tear away. This may result in severe hemorrhage or infection. Diagnosis is aided by the roughened feeling of the membranes near the accessory placenta. The anomaly is generally recognized only after delivery. If delivery of the placenta is made slowly and without traction the accessory cotyledon will generally fall out into the hand without any trouble. In case of retention there should be no hesitation at disinfecting the hand and removing the placenta manually.

Early Diagnosis of Pregnancy.—A. Spire (*Gaz. de gyn.*, Sept. 15, 1910) believes that it is possible in all normal cases to affirm the existence of pregnancy as early as the second month, in so far that it is a clinical if not a medico-legal certainty. The reasons for this diagnosis will be the cessation of menstruation and the changes in shape and consistency of the uterus and in its position. Suppression of menstruation is a point of the first importance in establishing pregnancy, provided that the patient has had her menses regularly throughout her life. With persons whose menstruation has been irregular it is of less value. Outside of pregnancy troubles must be severe to stop a regular menstruation. Those persons who think that they have had their menses during pregnancy have been mistaken, due to a mistaken interpretation of the facts; the flowing that has occurred has had neither the character nor the duration nor the periodicity of the menstrual period. Inspection will show the

changes of the breasts, the mammary areola, and the violet coloration of the vulva. But the most important points are obtained by abdominal palpation conjoined with vaginal examination. The large, soft, hypertrophied cervix may be simulated by other conditions of the uterus due to disease. It is to the changes in the fundus and body of the uterus that we must look for valuable information that is not to be confounded with signs of disease. For the vaginal examination the bladder and rectum must be emptied, and two fingers introduced into the vagina. The enlargement of the body is plainly felt, its shape is globular, and this is especially to be appreciated in the lateral culdesac. The change in consistency is great; it gives a sensation of elastic softness to the examining finger, like a ripe fig. The region where cervix and fundus join undergoes softening, such that it seems to yield before the finger, and the body may seem to be separated from the cervix. With the two fingers in the vagina, one on each side of the body, we may tip it from side to side. If the contraction of the uterus can be felt it is a still more positive sign.

Hydrotherapy in the Pregnant Woman.—G. Keim (*La Presse méd.*, Sept. 28, 1910) says that tradition has taught the laity that bathing is apt to cause abortion in the pregnant woman, and the teaching of at least one race is that the full bath is to be taken when confinement is near. On the contrary, it is probable that in persons accustomed to the daily full bath the continuance of the custom is not at all injurious. Since the pregnant woman is liable to attacks of congestion of the genital organs, especially at the time of the menses, it is not advisable to take hot baths at the period when the menses would have occurred normally. Some accoucheurs think that there is danger of the contamination of the vagina by germs from the bath water. It is certain that except in lax multiparæ the water will not enter the vagina at all. In any case the acid of the vaginal secretions will probably kill any germs that do enter. The cells of the vagina have a marked phagocytic power which will remove many germs. The full bath, by keeping up the activity of the skin, serves to stimulate the excretory functions. It is well to enjoin care in taking the bath in a warm chamber and resting in bed for two or three hours after it. The bath should be moderately warm, not too hot. After the cold bath the period of reaction is such that it might cause placental hemorrhage and abortion. Hence we should have great care in prescribing such baths, especially near the beginning of pregnancy. Sea-bathing is open to the same objection, and to a greater one on account of the force of the waves and its consequent effect on the circulation.

GYNECOLOGY AND ABDOMINAL SURGERY.

Inflammatory Tuberculosis of the Utero-adnexial Apparatus.—Antonin Poncet and René Leriche (*Gaz. des hôp.*, June 9, 1901) advance the theory that all cases of so-called arthritism are in

reality cases of latent tuberculosis, in which there is an inactive focus somewhere in the body, but in which the poisons cause the so-called inflammatory tuberculosis in the internal organs. This is the case in the uterus and adnexa as well as in the other internal organs. When we find young girls with an insufficient development, women with menstrual troubles that seem to have no cause, those in whom the maternal instinct is always unsatisfied, in the absence of syphilis we should think of tuberculosis and seek for it with every possible means. We may then in some cases succeed in unmasking the original infection, the cause of all these abnormalities. We may avoid useless and insufficient local treatment; general hygiene and change in the manner of life may arrest the lesions before they are irremediable. Inflammatory tuberculosis manifests itself in the uterus and adnexa by a general sclerosis. The result is a heavy, congested uterus, abdominal pains, and menstrual difficulties. Pain is especially located in the loins, thighs, and perineum, and is lancinating; the menses are prolonged. The cervix is hard and congested, and has been called the fibroid uterus. It is uniformly increased in volume. The tubes are healthy, the ovaries fibrous or cystic. To be an arthritic is to be subject to congestion of various organs; it is nothing else than to be tuberculous. These lesions are similar to the neuritis, cardiopathies, and rheumatism of tuberculous origin. Tuberculosis will suffice to explain most of the essential visceral dystrophies. In autopsies on the tuberculous the authors have found latent tuberculosis in almost all the microcystic ovaries examined, in which the disease had a slow course. In young women they have seen caseous tubes, and a fibrous ovary with small cysts. Hydrosalpinx without evidences of infection arises from the same cause in young women and girls; it develops slowly and without symptoms. A large number of infantile uteri and ovaries are due to tuberculosis. The disease prevents the development of the genital organs. Metrorrhagia and leukorrhea are often of the same origin. That dysmenorrhea so common in tuberculous patients is to be explained in the same way. Out of seventy cases of dysmenorrhea in tuberculous subjects, fifty-three submitted the use of tuberculin as a therapeutic measure; eight were not improved, five had less violent pains, forty were completely cured. Some of these patients have been reexamined after five or six months without return of pain. Of twenty-seven patients in whom vaginal examinations were made, twenty-three had signs of pulmonary tuberculosis; in four there was latent tuberculosis. Of these, the dysmenorrhea was cured in sixteen cases, lessened in three, and unimproved in three. Menstrual troubles are often a sign of latent tuberculosis. The efficiency of the treatment is demonstrative of the cause. Ovarian sclerosis or toxic impregnation of the Graafian follicles may cause infantilism, genital hypoplasia, amenorrhea, dysmenorrhea, and repeated abortions.

Artificial Vagina.—J. F. Baldwin (*Journ. Amer. Med. Assn.*, 1910, liv, 1362) reports a fourth successful operation for creation of an artificial vagina by drawing down into an incision in the perineum a loop of small intestine. This is resected without dividing the mesentery of the loop. The upper ends of the loop are closed and covered with parietal peritoneum. After anastomosis of the intestine the abdomen is closed. The loop, drawn down to the perineum, is opened, cleansed, and packed with iodoform gauze so as to make pressure against the walls of the perineal wound, while the edges of the opening into the bowel are sutured to the edges of the new vulva. Several weeks later the septum between the two arms of the loop is removed. A vagina with good vascular supply and no tendency to cicatricial contraction is thus obtained.

Modifications of the Hymen by Diseases of the Genital Organs.—F. Jayle (*Rev. de gyn.*, May 1, 1910) discusses the changes that occur in the hymen from various infections, syphilitic and non-syphilitic, occasioning in some cases an entire disappearance of the hymen. A woman with no hymen as a result of innocently acquired disease, may get the blame for having had coitus, while she is a virgin. Multiparæ who have had several children may show the most unchanged hymens. Any affection that causes ulceration may eat away a portion of the hymen. Syphilis, sclerosis of cicatricial nature, progressive atrophy, and traumatism may destroy a part of the whole of the hymen. Surgical traumatism and inflammations of chronic nature cause erosions of the hymen. Chronic metritis with irritating discharge occurring in infancy or adolescence may modify especially the posterior portion of the hymen. In all cases of double sclerotic ovaries, in girls, young women, adults, and women at the menopause, after months or years of disease, there is atrophy of the hymen with retraction. The membranous hymen easily becomes sclerosed and makes a cicatricial ring which renders coitus impossible. Ovarian castration brings about an atrophy of the hymen. The author concludes that the nonintegrity of the hymen, its atrophy, or even its entire disappearance is not always the result of coitus or the introduction of a foreign body into the vulva. Spontaneous disappearance of the hymen occurs only in girls who are castrated.

Red Degeneration of Fibroids.—On the basis of the study of four cases of this condition which he reports, H. L. Murray (*Jour. Obst. Gyn. Brit. Emp.*, June, 1910) gives the following life-history of *uncomplicated* red degeneration: Hemolysis takes place in some of the smaller degenerated vessels of a fibroid undergoing aseptic necrobiosis. This results from the action of hemolytic lipoids associated with the degeneration, and is inaugurated by a lack of the control which plasma can exercise. As a result of this upset, thrombosis sets in and the course varies with the amount of this latter. If it be very extensive, the clinical picture so frequently seen in pregnancy is developed, with much pain and enlargement of the tumor; but if it be slight,

the tumor may in time lose the red color and appear later as a fibroid showing areas of dirty yellow, gray, or brown. The principal conclusions from his study of the four cases are: That the lipoids of degenerating fibroids are markedly hemolytic. This hemolytic action is readily restrained by blood plasma. Excess of lipoid in a suspension of red blood-corpuscles leads to the development of a gray or brown color in place of the red. Thrombosis in red degeneration is not primary. Red degeneration microscopically is identical with certain other degenerating fibroids showing no red. The accumulation of lipoid is not, in the first instance, dependent on the presence or amount of thrombosis, but on the degree of preceding degeneration. Laking of the corpuscles has more relation to lack of the fluid constituents of the blood than to large excess of lipoid. Many of the stains in fibroids—not necessarily *red* stains—may be due to old symptomless hemolysis.

J. F. W. Ross and A. C. Hendrick (*Can. Pract. and Rev.*, 1910, xxxv, 273), however, in reporting one case, incline strongly to the belief that red degeneration is the result of infection of the fibroid with bacteria capable of causing hemolysis. Such are always in the immediate environs of the fibroid, *eg.*, staphylococci, diplococci, and streptococcus in the vagina and cervix, and bacillus coli in the intestine. Since red degeneration is a frequent complication of fibroids in pregnancy, it seems probable that the micro organisms may invade the uterine wall more readily in this condition. In the non pregnant uterus infection probably occurs from the intestine.

The Ureter in Cancer of the Cervix Uteri.—A. Leitch (*Jour. Obst. Gyn. Brit. Emp.*, April, 1910) states that involvement of the ureter is the commonest occurrence in postmortem examinations of cancer of the uterus. It can be demonstrated also in operable cases. This involvement consists in the production of stricture frequently (*a*) by contraction of growth in the surrounding parametrium; (*b*) by invasion of the ureter wall; and sometimes (*c*) by fibrosis in the parametrium, due either to chronic inflammation or to the reaction to cancer cells which have disappeared locally. The ureteral wall may be invaded by cancer directly from the surroundings, the invasion being sometimes evident on naked-eye examinations, at other times, even when extreme, demonstrable only by the microscope. Lymphatic permeation of the ureter does occur, and the lymphatic vessels of the ureter and parametrium probably communicate. The nature of the surrounding tissue in the parametrium, the open texture, the proximity of the principal lymphatic vessels from the uterus, the danger of invasion and the peculiarity of the blood supply render resection of the parametrial portion of the ureter advisable when the parametrium is invaded.

Position and Early Movement after Abdominal Operations.—The general rule is that, after an abdominal operation, the patient shall lie flat upon the back with a pillow under the

knees. C. M. Moullin (*Clin. Jour.*, 1910, xxxv, No. 23, 353) says that in the majority of instances this is unnecessary and in all cases is most uncomfortable. The natural position in bed is curled up on one side, and this attitude is the best after nearly all abdominal operations—on the right side after those on the appendix or gall-bladder, on the left after a gastroenterostomy. Young people and children may lie right over upon their side. Middle-aged ones are usually more comfortable with a bolster against their back to lean upon to some extent. But stout, elderly people with a tendency to chronic bronchitis cannot do this. They must be kept sitting up almost from the first. To the general rule that the patient's head should be kept low for some time after an operation there are many exceptions. In cases in which shock is severe lowering the head to the level of the body is not enough. The foot of the bed should be raised on blocks, and kept raised until the pulse has regained its tone and all fear of collapse has passed away. The same thing should be done if the patient has been operated upon in the Trendelenburg position. After gastroenterostomy and operations upon the biliary passages, the patient should sit up in bed as soon as the pulse will permit, in order to prevent vomiting. If a focus of infection is found in the pelvis or the lower part of the abdominal cavity, which may spread upward, the patient should be placed in Fowler's position as soon as the state of the pulse will allow it. The writer allows patients a day after clean operations, to be lifted out of bed to use the commode when the call is urgent enough to prevent their straining. Even when the muscles are divided, if they are properly sutured and supported from the outside it is quite safe, so long as the wound is a clean one. The writer favors lifting the patient into a chair for several hours a day soon after an abdominal operation, though voluntary movements must be prohibited lest the surgeon be blamed for any accident. The test when a patient may be allowed to control his own actions is simple. The writer makes the patient, while lying in bed, put the muscles that have been divided into action, and does not give him his freedom until the scar definitely sinks in when this is done. The actual choice of position may almost be left to the patient. Comfort is the best guide. No position which throws the least strain upon the wound can be comfortable for long. The chief argument used against allowing early movement after these operations is the fear of hemorrhage, ventral hernia, and pulmonary embolism. But there is not the least foundation for this. Hemorrhage may occur if some of the vessels have not been properly secured; and if this is the case, the earlier it occurs the better. But secondary hemorrhage in an aseptic wound is almost unknown. Ventral hernia, too, may develop if a wound is septic, requiring to be drained, or if the various layers of the abdominal wall are not properly adjusted; or from wasting of some of the abdominal muscles if the nerves that supply them have been cut across; but if the wound is aseptic

if the edges have been carefully brought together, and if the sutures hold well, there is not the least cause for alarm. The emboli which cause pulmonary apoplexy and sudden death after operation never come from minute vessels. They come from thrombi in the big veins often far removed from the seat of operation, such for example, as the left femoral or iliac in a case of appendicitis, and these thrombi are septic in origin. No one would advocate movement if the presence of tenderness over one of the large veins so much as suggested the possibility of a thrombus; but the presence of such a thrombus cannot in any way be laid to the credit of early movement. There can be no doubt as to the benefit the patient derives from having his position changed as often as it is uncomfortable and from being made to sit upright in a chair. The breathing is better. There is much less tendency to bronchitis and pulmonary congestion. There is no need to make use of a catheter. There is not the same necessity for purgatives. The relative position of the viscera is changed, so that adhesions do not form so readily. The muscles do not waste to the same extent. The joints do not become so stiff; and when the time comes for the patient to get about and stand upright and walk, the legs do not swell, and the period of convalescence, often the most irksome time of all, is materially shortened.

Total Abdominal Hysterectomy in Double Adnexitis.—Leon de LaCombe (*Gaz. de gyn.*, July 1, 1910) believes that we are justified in making use of a total abdominal hysterectomy in all complicated cases of bilateral disease of the appendages, as their removal leaves the uterus a useless organ which may perpetuate pain and leukorrhea. It is a mistake to await the benefits of a curettage or the atrophy of the menopause to remove all the bad symptoms. The removal of all the genital organs at one time is no more serious than the removal of the adnexa alone. The best operations are those of Kelly, Terrier, and Faure. That of Faure, with its hemisection of the uterus makes it easy to reach the adnexa of each side. An important question is whether we should leave the cervix in place or open the vagina. It is more elegant and more satisfactory to the woman to have a cervix than a cicatrix at the end of the vagina. The fear of infection from the vagina is exaggerated. On the other hand, removal of the cervix gives better drainage than that through the abdomen.

Cervicovesical Herpes.—Paul Petit-Dutaillis (*La Gynécologie*, July 1910) gives the history of a case which appeared at first sight to be one of gonorrhea, on account of the marked vaginal discharge. On careful examination of the cervix and vagina, with the denials by both husband and wife of gonorrhea, it was decided that this discharge resulted from the ulceration of a large number of small herpetic lesions on the cervix and walls of the vagina, which exuded muco-pus. Vulvar herpes is frequent and often recurs, especially at the menstrual period. First

occurs neuralgia of the labia, which become swollen, and then follow vesicles in groups, the surface of which becomes macerated and then ulcerates. Herpes of the cervix and vaginal culdesac is much less frequent. The preeruptive stage of congestion is rarely seen. A bacteriological examination is important to prevent the diagnosis of gonorrhea being made. The localization of the lesion, and the integrity of the mucous membrane above and below the area of the lesion, together with the severity of the reaction aid in making the diagnosis. Simple lotions of boiled water, with a vegetable diet, are sufficient treatment. We need not order antiseptic douches or long rest in bed, as would be done for gonorrhea, hence the importance of correct diagnosis in these cases.

Undiagnosed Hernial Cystoceles.—E. Meriel (*Gaz. de gyn.*, August 1, 1910) records under this heading several cases observed by him, in which in operating for an ordinary strangulated hernia it was found that a diverticulum from the bladder had become entangled in the hernial sac. Such a diverticulum may be incised and a flow of urine occur even when the greatest care has been taken during the operation. Fortunately, such a mishap results in a fistula which easily heals spontaneously. These diverticula are very thick and fleshy and surrounded by a large amount of fat, which causes their real nature to be mistaken. They may be found within the sac, outside of it or with an incomplete sac. For such a condition to occur the bladder must have been stretched and enfeebled by pregnancy, uterine tumors, etc. Constipation is another factor in their production.

Ehrlich's New Arsenical Preparation in the Treatment of Syphilis.—J. Dumont (*Presse méd.*, August, 1910) describes the use of the new arsenical preparation brought forward by Ehrlich under the name of "606" as a specific for syphilis. It is claimed that a single dose kills the *treponema pallida*, and that the disease is at once cured. The drug is a dichlorhydrate of diamidoarsenobenzol; an injection is given of 0.40 to 0.50 gm. in solution, partially neutralized with acetic acid on account of its extreme alkalinity, which causes great pain when injected into the muscles or veins. It is a drug that has a specific action on the *treponema* and after its use the Wassermann reaction becomes negative. The solution must be freshly prepared for each injection since it changes very rapidly. Injection of the neutralized solution into the muscles of the thighs is painless. On the following day there is a painful induration of the site of injection; this continues for from four to eight days after the injection, and necessitates the patient's remaining for two weeks in the hospital. The induration may go on to suppuration. The temperature rises, due to the destruction of the large number of *treponomata*, and nausea and vomiting occur. Leukocytosis is increased. There may be arrhythmia, acceleration of the pulse, and general malaise. A scarlatiniform eruption often occurs. The drug is eliminated by the intestine. After a single

injection chancres and mucous patches heal at once, and the roseola disappears. Tertiary lesions are especially affected by the drug. Its use is especially valuable in visceral syphilis. The spirochetes disappear from the lesions six to eight hours after the first injection. It is still too soon to pronounce on the final results of this drug but much is to be hoped for from its use.

Treatment of Vaginal Cystocele or Preuterine Hernia.—H. Violet (*Ann. de gyn. et d'obstet.*, August, 1910) states that cystocele and rectocele are caused by stretching and relaxation of the musculo-aponeurotic layer, which supports the uterus. We may distinguish primary prolapsus uteri, to be treated by hysterectomy or hysteropexy, eventration, and pre- and retro-uterine herniæ. The majority of cystoceles correspond to pre-uterine herniæ through the anterior sacrorectogenital aponeuroses and the union of the vesicouterine ligaments. The rectoceles correspond to herniæ between the uterosacral ligments. He gives a careful account of the technic which he uses in operation for cystocele under the following steps: 1. Dissection of a lozenge-shaped portion of mucosa on the anterior vaginal wall and cervix. 2. Dissection of the bladder from the anterior wall of the uterus. 3. Opening the anterior peritoneal culdesac. 4. Isolation of the vesicouterine ligaments up to their uterine insertion. 5. Passage of a ligature for fixation of the uterine isthmus in the peritoneal portion. 6. Closure of the anterior culdesac. 7. Suture of the vesicouterine ligaments throughout their extent from before backward after pushing back the bladder. 8. Amputation of the anterior tip of the cervix.

Experimental Study of the Method of Propagation of Tuberculosis of the Tubes and Rectum to the Bladder.—Filippo Cuturi (*Ann. des mal. des org. genito-urin.*, September 1, 1910) says that the hitherto admitted paths of propagation of tuberculosis to the bladder are the urethra, kidney, blood, and lymphatics. The author has made two series of experiments in animals to show the methods of propagation, causing tuberculous infections of the bladder by irritations combined with inoculations with the bacilli. He finds that when the bladder is in contact with tuberculous tubes the walls of the bladder and tubes are both traversed by the bacilli. The wall of the bladder at the place of contact shows a point of tuberculous cystitis. These experimental facts correspond to certain clinical forms of cystitis, secondary to tuberculosis of the uterus and tubes. The bladder may be infected by the transperitoneal route, by way of the urethra, from the kidney, and by blood and lymphatic infection. When the bladder has received the bacilli from a tuberculous rectum the maximum lesions are found on the mucosa, the minimum in the muscular and serous layers. With a tuberculous rectum, the bladder is infected by way of the lymphatics. The path of transperitoneal infection from the rectum to the bladder does not exist.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

THE CLINICAL ASPECT OF SOME RECENT RESEARCHES IN THE CHEMICAL PHYSIOLOGY OF INFANTS.*

BY
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It is not my purpose to give a summary of recent researches on the physiological chemistry of infants, but rather to discuss what bearing some of these discoveries may have on practical pediatrics. It is clear that the medical interest has shifted in the last decade from bacteriological to physiological phenomena. Every school of medical research is now intently working on the mysteries of metabolism, nutrition, and immunity. Certainly these efforts have already reaped some startling results, but it is doubtful that many of our preconceived working principles have been upset.

The old problem of the indigestibility of casein has been attacked from several sides, and the belief is becoming general that it is the fat and not the protein which causes the most common digestive disturbances in infants. Most clinicians will agree that a reduction of the fat percentage in substitute feeding often causes an improvement in certain forms of dyspepsia. Freund has, however, clearly expressed the common clinical experience that an increase in the percentage of casein often induces the formation of soap stools. Even Czerny and Keller admit that cream mixtures do not act in accord with their theory of fat indigestion. Not only protein but starches have the effect of changing a soft yellow to a hard white stool. The constipating effect of cereal decoctions added to milk is well known, and it is explained by the influence of the starches in causing in some way an increased combination of fatty acid with the alkaline earths, yet the fat absorption may be perfectly normal as far as the actual quantity absorbed is concerned.

*Read before the American Association of the Teachers of the Diseases of Children, June 6, 1910.

What causes the appearance of the soap stools? Freund explains this in this way: The formation of soap depends on the predominance of an alkaline reaction in the intestinal canal. Whatever increases the alkalinity favors its production, whatever reduces it diminishes the hard dry stools. Hence fermentative processes which increase the intestinal acidity do not favor the formation of soaps. On the other hand, putrefactive processes increase the alkalinity. Protein stimulates the alkaline secretion of the intestinal glands. Starches act in the same way. An excess of fat by increasing the acidity may diminish the tendency to constipation. Hence the appearance of soap stools should not be a clinical indication for fat reduction. The old observation that constipation may be relieved by increasing the fat percentage has received confirmation from recent researches. Sugar, milk-sugar, and maltose have a favorable effect on intestinal acidity. Olive oil and cod-liver oil also have a tendency to improve the constipation.

What harm do these soap stools do aside from the constipation? It must be admitted that clinically many infants present this symptom for weeks without any evidence of disturbance. One would suspect that the calcium absorption would suffer, but such is not always the case. The sudden appearance of hard light-colored stools in a healthy baby is a valuable clinical sign of indigestion, but that is about all that can be safely said. Certainly it is no indication that the fat is not absorbed in physiological amount. Alkalies are removed from the body by such stools and thereby produce enterogenetic acidosis, but this also is not always the case, since sufficient alkalies for the needs of the body may be absorbed.

The metabolism of protein in infants has been carefully studied by Orgler (1908). While the so-called curds in the stools are not casein as a rule, from my own observation I am inclined to agree with the American investigators that the large firm coagula do have a central nucleus composed of casein. The passage of these curds from the intestinal canal is exceptional, but it does occur. It is clear, however, that the protein of cows' milk is readily digested by the infant and its absorption is also as complete as that of human milk. Still it has been shown that its retention presents certain peculiarities. The retention of the nitrogen and phosphorus in the infant's body in artificially fed infants shows some strange irregularities.

We must conclude then that our difficulties with artificial feed-

ing do not depend alone on the indigestibility of casein. Czerny and Keller have laid down the law that the physiological refectation is the same in artificial and natural feeding, which means practically that an infant can thrive on substitute feeding and nothing more.

The elaborate and painstaking chemical analyses of the protein metabolism in infants have as yet given us very little which can be utilized in practice. Heubner's work on the caloric needs must be excepted.

Recent studies emphasize the importance of the carbohydrates. No fat metabolism can take place for any length of time without carbohydrates. As Rosenfeld has tersely put it, "the hydrocarbons are burned in the fire of the carbohydrates." Magnus-Levy has certainly collected strong evidence that the carbohydrates in a certain percentage are necessary to prevent acidosis.

It is well, therefore, in all diseased processes in which more or less complete starvation is necessary to insist on the administration of carbohydrates. Cereal decoctions and bread preparations should become more popular in our dietary regimen and replace the meat decoctions and beef peptone preparations. It is more important to give the sick child starch or sugar than protein in illnesses of all kinds, since their store of glycogen is very small. It should be remembered, however, that lactose may act as a poison, as Finkelstein has taught us, when it enters the blood and is not properly oxidized.

We should learn more concerning the clinical use of carbohydrates. What combinations can be given in the largest percentage without disordering digestion and metabolism is a subject which deserves careful clinical work. For instance, there is no work extant on the comparative value of cane-sugar and milk-sugar in infant-feeding. Some investigators insist that the former is less liable to cause nutritive disturbance. At least no intoxication has as yet been ascribed to it.

Fat metabolism without sugar leads to serious intermediary acidosis in the diabetic and also in the infant. This is no reason why we should all commence to feed our infants on skim milk. Our American teachers are much clearer on this point and most of them are unequivocally in favor of giving a good percentage of fat, and it is a delight to read that Schlossman is making a firm stand to combat the prejudice against the use of fat so prevalent in Europe. The temporary reduction of a fat percentage

in some digestive disturbances is a valuable therapeutic resource, but every infant must learn to digest butter fat as well as protein and carbohydrates.

The Berliner school, especially, has been studying the chemical metabolism of the mineral salts during the last few years. The recent discussion by Meyer on the importance of the mineral salts in the nutritive disturbance of infants shows how eagerly the offending substances of artificial food is sought. We are not ready yet to accept the dictum that the difference in the human and bovine milk on the infant is due to the difference in the milk sera and this depends principally on the excessive quantity of mineral matter in the latter. Clinical experience with the whey mixtures is opposed to the conclusions adopted after such few observations. The infant very soon acquires the power to reject or excrete the excessive salt in cows' milk. The few chemical analyses seem to show that there is a greater retention of salts in the infants fed on bovine milk, an observation not in accord with clinical experience.

The function of the salts in the retention of water is generally recognized, and Meyer has attempted to prove that it is the sodium cation which has the most importance in the gain in weight. This is in marked contrast to the potassium and calcium cations which do not alter the weight curve. Possibly the favorable effect of sodium citrate in certain cases may be referred to the favorable action of sodium on growth.

The regulation of the temperature too depends in a measure on the presence of certain salts. The sodium salts have a tendency to elevate the temperature; on the other hand, the calcium salts depress the temperature. Whether these observations have any practical benefit to be applied in the case of atrophic infants remains to be seen. The favorable effect of peptonized milk which has sodium bicarbonate added is not always manifest in such cases. Furthermore, the exhaustive study of Friberger on the pyrogenic qualities of sodium chlorid shows a very irregular and uncertain effect of the injection of physiological salt solutions. Metabolism is certainly changed by these salt injections, and the systemic reaction is by no means harmless, and in young infants serious symptoms may be produced.

Schloss puts the reaction in another way: Whenever there is rapid accumulation of salt or water in the tissues the temperature rises, when rapid excretion occurs the temperature falls.

It is a remarkable fact that human milk is comparatively poor

in mineral salts and Meyer has attempted to use this fact as explaining the benefit in diarrheas from the use of this milk on the ground that the infant has an intolerance to salts. It is true that pure whey often prescribed in diarrhea usually aggravates the condition. During an attack of dyspeptic diarrhea there is a great loss in salts, this loss continues for one or two days even after the use of human milk.

The great loss of mineral salts in infants fed on a high percentage of cereals has been emphasized by Czerny and Keller. It is always necessary to add common salt and possibly some calcium salt to all cereal decoctions, but these salts must not be given in too large quantities, for Koeppé found that even 1 gram of common salt disturbs the metabolism and increases the excretion of phosphorus.

The study of the metabolism in nutritive disturbances has revealed some interesting facts. It is doubtful, however, whether we are nearer the actual cause of these diseases. In the first stage of the indigestion (disturbance of the nutritive balance of Finkelstein) there is usually a deficient absorption of the alkaline earths, but it is premature to make this the cause of the lack of growth. The diminution in the absorption of alkalies in atrophy (decomposition of Finkelstein) is not the prime cause of the affection. Finkelstein deserves great credit for classifying the nutritive disturbances of infants in such a definite way. It is certain that the clinical recognition of his syndrome has a very important clinical bearing, since our therapeutic efforts may become more definite and can be more readily compared with the results of others.

But not many clinicians will agree that the absorption of lactose alone will produce the serious symptoms that occur in gastroenteric intoxication. There is a marked reduction in the power of oxidation and it is not unlikely that Howland and Richards in their study of indol intoxication were searching nearer the offending substance. The favorable result of starvation was a well-known clinical fact long before the researches of Finkelstein, but the explanation of this is still not clear. The theory of acid intoxication as the sole cause of nutritive disturbances is generally discredited on clinical grounds. It is a simple matter to administer alkalies in order to make up for the excess excreted, but this does not cure the atrophic infant. The intermediary acidosis is usually the result of an insufficient

supply of carbohydrates, while the enterogenic acidosis can be readily relieved by administering alkalies.

Great stress has been laid on the volatile fatty acids as toxic agents, and their etiologic relation in certain cases must be granted, especially in certain forms of dyspepsia, but there is no proof that they are the offending substance in intoxications.

The researches into the metabolism of rickets have not solved the difficulties; it seems, however, that there are several ways in which a deficient absorption or assimilation of calcium salts may take place and the disease is somewhat complicated. Clinically, too, there is a difference in the manifestations of this disease in infants following repeated attacks of nutritive disturbances and that form due to hereditary or racial characteristics. The most common type is that of infants in whom there has been repeated digestive disturbances or who have been fed on a low percentage of protein.

Recent studies have emphasized the relationship of tetany to calcium metabolism. The relationship is not clear, however, some asserting that it is an excess of calcium in the blood while others find a deficiency. The latter theory has the most to sustain it, although it is still inexplicable why the withdrawal of milk produces such wonderful improvement in spasmophilia.

In short, the chemistry of metabolism is revealing some interesting changes, but the clinician should hesitate to find in these abnormalities the real cause of the disease. As a rule, these chemical changes are incident to the digestive or metabolic disorder and not the actual cause of the disturbance.

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RESULTS OF INFANT-FEEDING WITH MILK FROM CITY-KEPT COWS.*

BY

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ABOUT seven years ago I took charge of a small nursery and training school for infants' nurses at the Chicago Maternity Hospital, in which were kept from ten to fifteen infants without their mothers. These infants were mostly healthy babies except for an occasional premature or malnutrition case. No effort was made to give service to surgical or general diseases, but

*Read before the American Association of Teachers of Diseases of Children, June 6, 1910.

to take merely "feeding cases." The idea was to keep about twelve babies to furnish material for training the nurses—feeding and hygienic care making up the chief part of their instruction.

For the first five years of my stewardship I studied the dairy milk problem pretty carefully, making several trips into the country to inspect the different dairies and bottling plants and testing the various milk products of all the best dealers, certified and otherwise, and proprietary infant foods. We found with careful nursing and handling of the foods and formulas that the death rate was rather low, but the general progress of the babies on the whole was not as satisfactory as I desired. As the days went by I found the dairy milk offered us more and more likely to give an occasional outbreak of intestinal infection which might not result fatally but which put the babies behind in their growth and strength and kept me constantly working to keep them up to an average in weight.

In looking over the records I find in the first five years 230 babies were under our nursery care. In that time there were thirteen deaths or a death rate of about $5\frac{1}{2}$ per cent.

In analyzing those deaths we find:

Two were premature, born in private homes and given unskilled care before reaching the nursery. One lived but one hour and the other about one day after reaching us.

Two died of influenza, twins small and delicate.

Four were badly infected intestinal cases admitted under protest but with the idea that we might be better equipped to care for them than those who were in charge at their own homes.

Five were intestinal infection cases that began under our care, making 2 per cent. of deaths from diarrhea arising under our handling.

This is of course not a high mortality, but it does not represent the morbidity which we had to contend with, though on the whole we were having as good results as most of the nurseries of similar character in the city.

In the Fall of 1908 I began to conceive the idea of getting a cow and keeping her near the hospital. I had tried keeping a goat for the most delicate ones, but found the milk of the particular goat I selected too rich and concentrated to be useful

and it was difficult to keep a goat in the neighborhood of the hospital.

Through the indulgence of a property owner in the neighborhood I secured the use of a tract of land of about five acres fenced and covered with good grass, formerly used by a gentleman for his coach horses before he discarded them for an automobile. Adjoining this tract were some tennis courts and lawns on which the caretakers cut considerable grass all summer. With this opportunity and a neighboring barn to be had for small rental we began with the purchase of a cow. The purchase of a milch cow may seem a simple matter to the uninitiated, but to me, not knowing the type of creature called a cow trader, it proved rather an intricate matter. The first fresh milch cow I purchased proved to be a dry one. I selected this animal through the aid of a man employed by one of our best large dairy firms and through the false presentation of the aforesaid cow dealer. After one or two efforts a good cow was obtained and we began feeding the babies from the milk obtained twice daily from the animal. The results were so good that we have now been keeping our babies on the milk from cows kept near us about one and one half years. In that time sixty-two babies have been cared for with two deaths. One from influenza and the other a premature infant from toxemia due to the condition of its mother before its birth. Next to no intestinal infection has occurred in the nursery and the growth and progress has been greatly improved notwithstanding we had a long and trying summer in which the infant mortality in Chicago was greater than usual.

The milk is collected from the cows after grooming and washing the udders into a sterile Gurler pail through a sterile layer of gauze and cotton. It is modified at once by the diet nurse for the next twelve hours' feeding and iced as usual. The next supply is obtained at the end of that time and prepared for the next twelve hours. The cows that we have used have been such animals as I have been able to pick up at the stockyards and by correspondence with country dealers.

The two best animals have been of Durham and Holstein breeds. Jerseys we have rejected because of the high per cent. of butter fat in the milk.

The cow which has given us the best satisfaction is a small black and white animal of Holstein breed. Her milk remains about 3.5 per cent. butter fat and she has given a fair quantity

of milk for eighteen months. The other, a Durham mixed breed, was able to yield from eighteen to twenty-two quarts of milk through the summer of 3.8 to 4 per cent. butter fat, but checked in quantity by fall to such a degree that she became unprofitable and was sold in December.

The cost of feed and help brings the cost of the milk up to about the price of certified milk (15 cents per quart) in Chicago, but the results with the babies I believe to be far better than with such milk. The plan used in feeding this milk has been to begin in average babies of two weeks with 8 ounces daily diluted with 16 ounces of water and partially peptonized where it seemed necessary by using a few drops of the elixir of lactopeptin or other peptonizing agent in the bottle after warming it for each feeding. The amount of milk is then increased little by little till the infant is on whole milk. This is accomplished at varying months depending entirely upon the baby's digestive powers. Some have been able to take care of whole milk as early as three and one-half to four months, but the larger number have done better to be kept on a small amount of dilution till the sixth or seventh month. When little or no water is given in the milk water is given at more or less regular intervals to quench thirst and prevent constipation. The peptonizing is decreased gradually and ceases generally after the third or fourth month. In many instances much earlier.

The stools of these babies remain smooth and yellow and we find ourselves practically free from diarrhea. Now and then if the workers are not supervised closely some error will creep in and a green stool will be reported. It generally means overfeeding, careless milking, or some error on the part of the one who modifies or gives out the food. Having gone over each detail from cow to baby carefully we generally find the error, and when corrected and a dose of castor oil has been administered we have plain sailing again.

There is no doubt with amateurs always handling the modification, as each pupil nurse takes her turn in being responsible for the diet and as I am my own head nurse and not always present, there are occasional lapses in correct asepsis, and where the milking is concerned it is still more probable as my milkers have not been of the skilled or most intelligent class except in a few instances, yet with all the makeshifts of a poor barn, unskilled and shiftless milkers such as I have had to put up with, the results have been such as to make me resolve to go on with

the experiment as long as I can pasture my cows in the neighborhood.

I now take young babies in delicate condition with greater confidence and send them out in better condition than I have ever been able to do.

The history of a frail little mite which I took when I first got the city cow well installed may serve as an example of what can be done by this bringing the baby and cow closer together.

Baby E. T. Born of a toxic mother who died in eclampsia on the following day. Entered the hospital on the fifth day. Weight, 3 pounds 13 1/4 ounces.

She was weak and jaundiced, but took the fresh cow's milk well without peptonizing.

Her weight schedule ran as follows:

Feb. 1, 1909,	3 lbs. 13 1/4 oz.
Mar. 1,	4 lbs. 5 1/4 oz.
Apr. 1,	5 lbs. 3 oz.
May 1,	6 lbs. 3/4 oz.
June 1,	7 lbs. 10 3/4 oz.; 6 bottles whole milk 5 oz. each
	June 12.
July 1,	9 lbs. 7 3/4 oz.
Aug. 1,	11 lbs. 3 1/2 oz.
Sep. 1,	12 lbs. 1 1/4 oz.; 6 bottles of 6 oz. each.
Oct. 1,	13 lbs. 1 1/2 oz.
100 STATE STREET.	

METHOD OF FEEDING OF MORE IMPORTANCE THAN CHOICE OF FOOD IN SUBSTITUTE FEEDING OF INFANTS.*

BY

CHAS. DOUGLAS, M. D.,

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Detroit.

ABOUT ten years ago I found it necessary to keep an exact record of the proportions of the different ingredients in the food of infants that I might avoid mistakes in thinking of the food and the proportions therein. Also in these records I found it necessary to report the results shown by these foods upon each infant. This was forced upon me that I might talk correctly

*Read before the American Association of Teachers of Diseases of Children, June 6, 1910.

from day to day to each mother or nurse and avoid the confusion and mistakes which were rapidly creeping into my work while depending upon my memory for all these details. The questions asked me by mothers and nurses caused me to enlarge these records until all the essential features needed for the mother's instruction and my own work were carefully and regularly recorded. Gradually this accumulation of material assumed the form of a rather large chart which consumed a good deal of my time to fill each day. Very soon interested mothers showed a desire to keep a copy for their own use and I at once saw the advantage of having each mother fill this chart regularly each day and thus save me the trouble. In this way I saved time for myself, interested the mothers more thoroughly, educated them more quickly, and thus obtained very much better results. I soon found that these mothers, in filling the charts, had their minds concentrated upon the essentials of the infant's dietary and the results produced by each article in it. They also quickly became educated beyond the pernicious and injurious advices of their friends and neighbors and became very much more intelligent mothers, more patient with the difficulties in feeding their infants, and exceedingly enthusiastic in carrying out all the details of this tedious work. These charts filled by many mothers, long distances apart, brought out many new facts which were exceedingly instructive to me and very beneficial to my patients.

Two distinct features are necessary to observe in successful substitute feeding of infants: The first is to select that fat proteid and carbohydrate suitable to the infant. The second and more difficult one is to give only such proportions of these foods as will meet the patient's present necessities and guarantee the future health and growth of the little one. I have found much more time, thought, and education necessary to correctly use any food than are necessary in selecting it. Without this careful adjustment of fat, proteid, and carbohydrates to the full but not overuse of the infant's different digestive secretions, all foods are failures and the patients gradually pass into that form of malnutrition peculiar to its constitution and the damage resulting from that fat proteid or carbohydrate wrongly used.

In speaking about the feeding of infants a physician should always specify whether he intends his remarks to apply to perfectly healthy infants with normal digestive power or whether he refers to children born with imperfect digestive glands or

whose digestive glands have been damaged by previously unsuitable food. My patients are mostly of the latter kind.

Size of Meals.—The following rules are applicable to all grades of digestive power, but are especially applicable to those infants who have congenitally weak or imperfect digestive glands and those cases who have acquired by abuse from mothers milk or substitute foods these weakened digestive glands. In other words, their power to digest either fat, proteid, or carbohydrate has been lessened or entirely destroyed. Having selected a food which seems suitable to any case, it immediately becomes necessary to specify the size of meals and the frequency with which they can be given. On this point there can be no doubt that the size of the infant rather than its age must be the guide, but in all cases the size and frequency must be governed by the results shown by the infant. It is here necessary to impress upon the mother that the rules applicable for a nursing infant are not in all features possible in substitute feeding. A nursing infant can thrive and do well on healthy human milk and vomit frequently each day. This is impossible in substitute feeding, as these infants never thrive who continue to vomit from day to day. The meals must be reduced within the child's capacity to retain them at all times. During the first six months at least these infants can partake of and must have meals from one-half to one ounce larger at night than they can retain in daytime. Experience shows that at this age infants digest more perfectly and vomit very seldom at night even when they vomit the same food frequently in daytime. This is, I think, accounted for by the anesthetic influence of sleep lessening the irritability of the stomach at night.

Frequency of Meals.—Frequency of feeding is always governed by the child's present capacity. A strong good digester can take large meals at long intervals. A very young infant and an infant with naturally poor digestive power or one who has been injured by previously unsuitable dietary must have his meals in small quantities at frequent intervals. The size of the meals and the time between feedings are entirely controlled by the infant's ability to digest the meal comfortably. That amount of food which makes the child gassy, colicky, or sleepless cannot be successful. Absolute comfort of the infant is a necessity for success. From the above it is apparent that the number of meals fed daily must be governed entirely by the child's ability to properly appropriate its foods. Experience shows me that

every infant secretes a fixed amount of digestive fluid after receiving a meal. The healthy strong child, with good digestive power, will secrete enough fluid to convert a meal big enough to last him three hours; while a weak digester can secrete only enough to convert a meal that will last him one hour. Success demands that each child must receive at every meal only the amount that he can digest perfectly. Fortunately the weak digester when properly fed can and will repeat this digestive secretion as often as every hour successfully. In this way by numerous small meals he can obtain each twenty-four hours enough food to give him a slowly increasing weight, and he thus in time with fifteen to eighteen small meals daily gradually overtakes the more vigorous digester who consumes only six to eight meals daily.

Increases of Food.—Proper increase of food demands that only one change should be made every two days in the amount of food which the child receives. Twenty-four hours may not prove the correctness of the food, but forty-eight hours will invariably do so. By observing this rule only small mistakes can be made and each mistake is quickly recognized and easily corrected. Increases in size of meals can never be made at the same time that the food is strengthened in quality. All the day meals should never be increased in size at once. It is not possible to successfully increase the size of more than two meals in any one day. In a very much underfed infant these increases can be much larger than are allowable in an infant who is increasing in weight from five to seven ounces each week. Experience with these charts shows that the infant growing from six to seven ounces weekly will continue to do so by adding only one teaspoonful of cream, skim-milk, or carbohydrate to the whole day's dietary every second or third day. To do perfect work it is necessary that additions of food be made continuously of the same element in the food until the infant shows some distress or inconvenience, such as extra gassy discharges, restlessness, foul or mixed colored stools, from such additions. When this occurs this element must be reduced to the comfortable point, and further increases should be made from one other element of the food in like manner. By interchanging in this way all elements in the dietary can be increased in rotation, thus safely building up a reliable nutrition for any class of infant.

The Digestive Glands are Injured by Overfeeding.—The power of the infant to digest fat, proteid, or carbohydrate is always

maintained and increased when the amount given is kept within the bounds of perfect digestion. As soon as any food is given in excess of the digestive secretion suitable for that food fermentation or decomposition results, and the power to digest that food steadily decreases as long as this excess is continued. It is only a matter of time until in this way the child's ability to take that food is materially lessened or entirely destroyed. This condition can always be avoided by decreasing the food when the infant shows gassy discharges, foul odors, soft or mixed colored stools. This process explains the steady wasting of nursing infants when the mother persists in nursing regardless of gassy discharges from mouth or rectum, vomiting, colic, mucous stools, and decreasing weight. Usually when weaned these infants are very difficult to feed, showing the marked damage caused by the unsuitable fat, proteid, or sugar of the mother.

Number of Stools.—Inherited ideas and opinions of other women always make the mother think that it is necessary for the infant to have several stools each day and that when the stools are very soft and easily voided this condition is perfect. While this fact applies to the healthy nursing infant it is impossible to make a hand-fed infant grow and remain healthy long under these conditions. The stool of the properly fed infant must be only one shade in color and retain formation to secure present comfort and future success. Soft and splashy stools are an evidence of fermentation or decomposition and while it is necessary to introduce some foods which will to a slight extent ferment or decompose in the alimentary canal, in order to avoid too decided constipation, this fermentation or decomposition must be kept carefully under control in order to avoid future complications and damage to the infant. Where the stools are kept in this healthy character the child never suffers from colic or gassy discharges, sleeps well at night, is happy and comfortable during its waking hours, and increases in weight regularly each day. As soon as the stools become mixed colors, foul odored, soft or splashy, the child becomes cross, sleeps poorly, and loses weight regularly until the stools again become formed, one shade in color, and free from foul odors.

Feed: How Often?—In filling these charts I found it necessary for success to add one question; namely, "hungry before meals—how many minutes?" In every case where the mother answered this question by feeding within five or ten minutes of the time when the child became hungry the baby increased in weight

steadily and satisfactorily. Where this blank was filled in showing that fifteen minutes elapsed after the child showed hunger before being fed the weight showed no increase. Where this question was filled in by showing that the child was compelled to wait twenty minutes after becoming hungry before being fed the weight showed a decrease of from three to four ounces each week; and where an interval of thirty minutes elapsed between hunger and feeding the child lost in weight from four to six ounces each week. By allowing eight meals daily it is at once seen that an infant waiting twenty minutes while hungry between meals would be fasting two hours and forty minutes, and the one waiting thirty minutes would be fasting four hours daily. It is impossible for anyone to avoid losing weight on such long fasts each day.

It will thus be seen that the infant who is digesting properly cannot have a fixed hour for feeding. He must always be fed at about such an hour, the time varying from fifteen to thirty minutes, or as soon as he becomes hungry.

When an infant's food causes a gassy, colicky condition with loss of sleep the hour of feeding must be a fixed one till the diet is adjusted to perfect digestion. No one can tell when a gassy, colicky child is hungry, for he acts hungry and will take food any time.

959 JEFFERSON AVENUE.

NASAL DIPHTHERIA IN INFANTS*

BY

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NASAL diphtheria is not uncommon, but is often overlooked and the condition illy diagnosed. My own observations since the days of my internship at the South Department of the Boston City Hospital and down to the present time lead me to believe that nasal diphtheria in young infants is fully as common, if not more so, than is pharyngeal, but is passed off as a common cold. Were microscopical examinations made of the nasal secretion which has persisted for some time with no other observable causes, we might find the condition a more common one, as did Nemann, Schiller, and Stenger. I have verified this. The

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subject is not a new one. Severino mentions cases in the sixteenth century according to Anton; even back in 1748 in Normandy, France, gangrenous nasal diphtheria or a form of nasal inflammation similar to that of nasal diphtheria of the present time is recorded. Chalmer in 1771-1775 mentions conditions akin to our own acknowledged nasal diphtheria which extended from the pharynx to the nose and into the Eustachian tube. Alaymus, indeed, in the seventeenth century observed similar cases in Naples and Sicily apparently of a primary and not of a secondary nature.

The cause is the Klebs-Loeffler bacillus. The predisposing factors are rachitis and malnutrition, such infants being predisposed to any inflammatory condition of the nasal mucous membrane. Bottle-fed infants, their mucous membrane lacking the vitality, the life of those of nurslings, are subject to it. Congested tenements, illy ventilated rooms, adenoids, congestion of the epipharynx, articles placed in the nose, and deflected septa aid materially in producing a fertile soil. Even in healthy nurslings any draught may cause primarily a congestion of the nasal mucous membrane followed by the implantation of the Klebs-Loeffler bacillus.

Care must, however, be taken in ruling out those catarrhal conditions resulting from measles, influenza, pertussis, typhoid, syphilis, etc., the absolute diagnosis only being possible by a microscopical examination. Parnicko sums up the condition in these words: "The diphtheria of the nasal passages is dependent upon the disposition and constitution of the patient, to the virulence of the bacillus, and to the presence and activity of other microorganisms."

Nasal diphtheria in my experience is never absolutely of a pure character, but the simplest forms show a greater or smaller number of other bacteria. Nasal diphtheria is both primary and secondary. The condition runs through three stages: that of a catarrhal rhinitis, that of a fibrinous rhinitis, and that of a diphtheritic catarrhal rhinitis.

In the primary form nurslings as well as artificially fed infants are affected. This form may stop at the simple acute catarrhal stage and get well without involving the pharynx or the adjacent sinuses in the least. The mucous membrane is reddened, slightly puffy, the discharge is watery, usually profuse, but colorless. Of the bacilli the Klebs-Loeffler predominates.

The discharge changes to seromucus, the color to dark gray,

brown, etc., bloody red or streaked with blood if streptococci, staphylococci, and the pseudobacilli are present. At times a slight cervical adenitis of the affected side is seen. If both nares are affected a moderate adenitis of the anterior cervical glands on both sides of the neck is present, which glands are considerably swollen and perhaps slightly painful. This stage is often overlooked and not treated, passing away in a few days leaving the mucous membrane sound as before infection. The fever is rarely high, the prostration never marked, the infant rarely very much indisposed.

The primary form, particularly in the first stage, in my experience does not tend to involve the pharynx unless the infant is malnurtured, has adenoids, a malformed nose, a deviated septum, or the like. The primary form may pass from the initial stage to the second or fibrinous; likewise the extension of the process from the pharynx to the nose may cause the secondary form also to develop into the same stage.

The fever is low, in fact characteristic of true diphtheria, never over 100.5° F.; prostration is often marked. Both nares, or less commonly, one are swollen, the mucous membrane is thick, gray, grayish-white, at times tinged with yellow or streaked with blood. A characteristic diagnostic and diphtheritic fetid sweet odor is experienced rather oftener during the first stage. If a piece of the membrane is pried off through sneezing or from picking the nose, the base is seen to be bloody, excoriated, hyperemic, or glassy. A new membrane or thin crust in its place is seen the next day. In eight to ten days the membrane disappears, if untreated, before if treated, leaving a moderate diphtheritic catarrh or the third stage of the disease. The fever now has subsided if no digestive symptoms are present, while the constitutional symptoms are lessening, but the sneezing which occurs during the first two stages still persists. This latter catarrhal condition may last for weeks. Later Frankel's bacillus, the pneumococcus, the pseudodiphtheritic and the staphylo- or streptococcus may implant themselves upon this fertile soil.

The clinical appearance of a case as seen in the second stage is one not easily overlooked. The nose is moderately puffy, soggy, flattened, often partially or totally occluded, the mouth open, the infant gasps for air, and there is often marked dyspnea. The membrane may be seen protruding while a thin colorless or bloody catarrhal secretion bathes it. Excoriations are seen under the nares and around and above the upper lip. Such

a condition interferes with nursing, bottle-feeding, sleeping, nose breathing, and resting. The infant meanwhile grows weaker and weaker and finally dies of asphyxia.

The persistency of the third or the diphtheritic catarrhal stage is undoubtedly due to the implantation of the bacillus in the accessory sinuses of the nose. Councilman, Mallory, and Pierce, according to Holt, have shown that it is common for the accessory sinuses of the nose, particularly the antrum of Highmore, to be involved, and the closing of the Eustachian tube from the extension of the process may also take place. The infection may extend also through the lachrymal duct, closing it and causing the eyes to overfill with tears which flow down over the face. The frontal sinus likewise may be involved. The Klebs-Loeffler bacillus is at all times tenacious of life and can easily live for a long time on friendly mucous membranes.

In infants the cervical adenitis of any stage rarely terminates in sloughing or abscess. I remember one case in the Boston City Hospital where putrefying bacteria implanted themselves upon a fibrinous rhinitis giving rise to a markedly putrefactive condition dirty brown in color and streaked with yellow, while over it blood flowed down the face. The smell in such cases is overpowering.

The above classification as to the three stages of nasal diphtheria I believe to be the best one. On the other hand, some authors, as Frankel, Hoffman, and Beck, think that the second stage, fibrinous rhinitis, is an independent disease, as few Klebs-Loeffler bacilli are apparently found and these due to their implantation on the surrounding membranes. Baginsky, however, considers fibrinous rhinitis diphtheritic unless bacterial examination proves otherwise. Bretonneau sums up his idea of the diagnosis of nasal diphtheria when he says that one or two enlarged glands combined with redness of the upper lip on the same side as are the pathological lesions, are pathognomonic symptoms.

The nasal type of diphtheria may be remarkably contagious. Often the most virulent forms of bacteria are found where only moderate lesions are present as seen in the first stage and in the last stage of the disease. The contagiousness, the easy transmission of the secretion from the nasal passages of the patient to the susceptible mucous membranes of the recipient as in caressing, kissing, etc., the long life of the bacillus and its capability of causing an epidemic after the acute symptoms

in the subject have long subsided, render the danger a very acute one. Park in 1892 was able to demonstrate four months after removal the presence of living diphtheria bacilli in a bit of membrane no larger than a pin's head.

The first form, that of simple catarrhal rhinitis, is, in my experience, the most virulent, the fibrinous form the next, and the diphtheritic catarrhal form the least. The bacillus is conveyed indirectly on articles of clothing, linen, brushes, handkerchiefs, shoes, food, dust, milk, and in innumerable other ways.

The prophylaxis of the patient and of his surroundings is almost as necessary as is the treatment; conscientiously done it means no further contagion. A suitable room should be chosen facing south if possible, sunlit, having proper ventilation but no draughts, and capable of an average temperature of 70° to 75° F. Plates, bottles, nipples, spoons should be sterilized; napkins to receive the nasal discharges, of Japanese paper preferably, should be burned before taken from the sick room. The room itself should be free from as much furniture as possible and that present should be capable of being cleaned. It should be aired daily. Cheap toys need not be withheld and can be destroyed after convalescence. When the infant is well this room should be rendered livable by fumigating with formaldehyde candles before use, leaving all the articles used during the illness in the room, including the blankets, rugs, and the clothes of the attendant. The room should be sealed tightly for forty-eight hours after the formaldehyde treatment. The attendant before entering the room during the illness should wear a suitable cap and gown and come in contact with the patient as little as possible, and if possible only with the hands. An immunizing dose of antitoxin should be given to each member of the family, 500 to 2000 units, as the ages warrant, subcutaneously or by the mouth, and they must not mingle with others. A solution of corrosive sublimate 1-5000 should stand in a porcelain bowl before the door of the sickroom and persons leaving that room must sterilize their hands.

Swab cultures from the nose ought to be taken every three days until no bacilli are found to be present, care to be used in pushing the swab gently toward the posterior nares. I often find positive cultures weeks after an observable cure.

The general treatment of the infant is simple. Do little but do that little well is a good motto. During the first or catarrhal stage the infant suffers little from prostration, malaise, or loss of

appetite. A nursling should have its regular feedings from the mother, the latter protecting the nipple by cleanliness immediately after nursing. She, moreover, should receive a larger immunizing dose of antitoxin than does the rest of the family. A bottle baby should have its modification of milk at regular intervals as before. If the modification is not taken well it is best to weaken the proteids. During the summer months the infant can be kept on the fire escape or sheltered on the roof. During the intervals between feedings I give $\mathfrak{3i}$ to $\mathfrak{3iii}$ of fruit soups or raw pineapple or orange juices, warm, uncooked and slightly sweetened.

Do not use nasal douches. The infant should be bathed two or three times a day, sponged in water at 85° to 105° F. Pledgets of absorbent cotton moistened in carbolic acid 2 per cent. and inserted alternately in both nares afford great relief.

In the fibrinous form food is often not relished owing to the systemic infection, occluded nares, and the loss of strength. It may be at times best to take away the modification or the breast-feeding for a short time and give peptonized milk or wine whey, using $\mathfrak{3ss}$ of old sherry wine to a cupful of milk or adding $\mathfrak{3i}$ to $\mathfrak{3iii}$ of this wine whey to a reduced modification of milk; while bathing the patient in warm water three or four times a day is very necessary. For the prostration strychnine gr. $\frac{1}{200}$ to $\frac{1}{150}$ by the mouth or subcutaneously, preferably by the former, is efficient. Caffeine in my hands, gr. $\frac{1}{20}$ to gr. $\frac{1}{4}$, two to three times daily has acted well. Camphor is also useful as the spiritus camphoræ in 5 to 10 m. doses.

Broths, bouillons, peptonized milk are at times needful. Castor oil in small but frequent doses relieves the constipation. Fruit juices, such as pineapple and orange, raw but warm, and fruit soups, warm, can be given from the first between feedings; they act as a laxative diuretic and as a mild tonic.

These soups are made by boiling fresh or dried fruits for many hours in water plus sugar, pressing and straining through two layers of clean muslin cloth, thirty-one to thirty-four can be given one, two, or more times daily. These cooked fruit juices contain albuminates, carbohydrates and organic acids in the same proportion as found in the raw juices, yet the latter possess the tang, the volatile elements, the life, which are so stimulating and refreshing.

Pledgets of raw warm pineapple juice soften and probably partially digest the crusts and can be followed with pledgets of cot-

ton containing carbolic acid 2 per cent. or warm sweet oil, hydrogen peroxide $\frac{1}{4}$ strength, or warm argyrol 5 per cent. Wet cold cloths over the inflamed nose sometimes relieve. Nasal douches push the infected membrane into the nasal pharynx, causing further infection of the surrounding sinuses and are therefore contraindicated.

The third stage should be treated by conditions governing a healthy infant. That means proper food, bathing, and fresh air, and a normal salt solution two or three times daily, warm, should be allowed to flow under no tension through the anterior nares and into the pharynx. The fruit juices should be continued as desired by the little patient.

The use of Behring's serum or antitoxin in all forms of diphtheria is most important. Since my internship great changes have taken place in its preparation. It is now more concentrated and void of certain irritating qualities the first used serum possessed making at that time the cure worse often than the disease itself, as was seen in the distressing urticarias and digestive conditions resulting. Enough serum should be given to our little patients to neutralize the poison and therefore the dose is dependent upon the age of the patient, the severity of the intoxication and the extent of the nasal membrane. Therefore it is well never to wait for a pathological examination in a suspected case, but to give the serum immediately. In the initial stage of the disease little antitoxin is needed. Fifteen hundred units injected deeply into the buttock with a subcutaneous syringe and needle, which can be rendered aseptic, once, and followed by 2000 units by the mouth, given at the midway point between feedings for once or twice at intervals of six hours, is usually enough.

The intense intoxication affecting the heart, liver, kidneys, and the postdiphtherial paralyses I have never seen after the primary form or after the first stage, but following the second and third stages. More or less albumin is present in the urine in all stages. In the second stage I followed up the original injection by another five hours later, or, again, perhaps a third deeply injected into the buttock. As the membrane disappears 2000 units are again given by mouth once, twice, or three times as the case may warrant. Study of the condition of the membrane and of the intoxication at each visit should be of paramount importance. In my hands this mouth method has worked well for years. Escherich of Vienna has tried the serum by mouth

and rectum and has got good results from the former method. Salge experimented by giving antitoxin in milk. None was found in the blood. He therefore concluded that the homologous proteids of the serum of the horse could not pass through the walls of the alimentary canal. Uffenheimer, however, found different results. Pick, in an experiment lasting nine days, showed that two-thirds of the antitoxin given by mouth was destroyed during the trypsin digestion and he believes that the intestinal bacteria exert harm upon the antitoxin. It is possible he says further that the homologous or heterologous nature of the antitoxic serum may influence absorption.

Primary nasal diphtheria tends to remain primary unless malnutrition adenoids or malformation of the nasal septum be present. Antitoxin is not infallible. Most physicians think that Behring's serum given early prevents postdiphtheritic paralysis, or the intense degeneration of the different organs. Unfortunately some cases are governed by no direct rule and paralyzes appear in spite of the serum and resist treatment. Clapies offers a plausible explanation for this. He considers that two kinds of diphtheritic paralysis exist, the one cured by serum, being due to soluble toxins produced by the Klebs-Loeffler bacillus, the other resisting the serum, arising from endotoxins or poisons produced by the bacterial bodies themselves. Rist proved by experiments the reality of paralyzes brought about by these products in animals which behave like the obstinate paralyzes in man, and raises the hope that a combination of an antiendo-toxic with the antidiphtheritic serum may eventually absolutely prevent these paralyzes whatever may be their pathogeny.

III WEST SEVENTY-SEVENTH STREET.

TRANSACTIONS OF THE ASSOCIATION OF AMERICAN TEACHERS OF THE DISEASES OF CHILDREN.

(Continued from November.)

Monday Afternoon Session.

PEDIATRIC TEACHING IN ST. LOUIS UNIVERSITY.

DR. J. R. CLEMENS.—Didactic lectures are given one hour a week, the first fifteen minutes being devoted to a quiz over the main points of the preceding lecture. The chief aims are to give the student a working knowledge of the hygiene, general

care, growth and development of the body, common diseases of children, and clinical methods of examination so that in his clinical work the following year the student will possess sufficient familiarity with the subject to allow him to spend as much time as possible in the study of physical signs in the normal infant and the different clinical pictures presented by the sick infant.

Owing to the difficulty experienced by so many practitioners in handling infant-feeding, special efforts are made to simplify the subject so that when the students are taken to the diet kitchen the following year the subject will be easier to grasp. A sufficient number of problems are given the students so that they can at once figure out the home preparation of any formula.

Syphilis, tuberculosis, rheumatism, nutritional diseases, and diseases of the digestive and respiratory tracts are considered.

The work for the senior class is divided as follows:

- A. Exercises for the entire class.
- B. Exercises for sections.
- C. Examinations.

The institutions affording opportunities for the daily clinical teaching to the class are:

1. St. Anne's Asylum: capacity, 125 infants, ranging in age from the new-born to the age of three years, the majority of the infants being under one year of age. At this institution every opportunity is given by the authorities for postmortem work and for exercises on the dead infant, in the teaching of tracheotomy, intubation and lumbar puncture, and in the study of topographical anatomy.

2. St. Joseph's: a male orphan asylum of some 325 boys, ranging in age from three to twelve years.

3. St. John's out-patient children's clinic.

4. St. Louis University out-patient children's clinic.

Exercises for the whole class are conducted at St. Anne's throughout the school year each Monday morning from 9 to 11 A. M., and at the St. Louis University Dispensary from 3 to 4 P. M. each Wednesday afternoon throughout the year.

The whole class meets at 9 A. M. at St. Anne's and immediately divides itself into sections under instructors. The entire morning during the first semester is devoted exclusively to the study of the physical signs met with in the normal infant and young child. The students are taught the importance of palpation of the fontanel, are made to examine the tympanic membrane, to inspect the gums, mouth and throat, to identify drainage

areas of lymphatic glands of head and neck, to make pulse-respiration counts, to percuss out thymic, cardiac, hepatic and splenic dulnesses, and to auscultate heart and lungs. In the second semester the first hour on Monday is still given up to the exercises just described, the second hour being devoted to the examination of sick infants and to diagnosis, as well as to the examination of stools. From time to time during the year the technics of stomach washing, of colon flushing, of resuscitation of asphyxiated infants and of other important procedures are demonstrated.

On Wednesdays between 3 and 4 P. M., throughout the year, at the St. Louis University Dispensary during the first semester, didactic and clinical lectures and case demonstrations are given before the full class. This hour in the second semester is devoted exclusively to infant-feeding and practical instruction in home modification of milk.

Sectional Work.—At St. John's and St. Louis University Dispensary patients are examined by members of the section under the personal supervision of the instructor. He next demonstrates each case and closes the exercise with a short talk on the most instructive case. During the year each section assists at fifteen such exercises. On certain afternoons, when opportunity offers, sectional work is carried on in the post-mortem room at St. Anne's, where each student is instructed in the operation of tracheotomy and intubation. Postmortem examinations are conducted under the direction of Dr. R. L. Thompson.

Examinations.—At the end of the year each candidate for graduation presents himself for examination at St. Anne's where he has submitted to him in the wards cases for physical examination and diagnosis. No written examinations are given. More than thoroughness of drill in the rudiments of pediatric practice and in the home modification of milk this department does not attempt.

PEDIATRIC TEACHING AT WASHINGTON UNIVERSITY.

DR. GEORGE M. TUTTLE.—The Medical School of Washington University was formed in 1899 by the amalgamation of the two original medical schools of St. Louis, the Missouri Medical dating from 1840, and the St. Louis Medical dating from 1842. Naturally the new school inherited a double set of professors with their assistants. The chair of pediatrics was

no exception, and consequently the time given to the teaching of the various subjects connected with the diseases of children is rather more than the average. The Association of American Medical Colleges asks as a minimum allowance eighty hours, while we give one hundred and five to our students.

The work is partly in the third and partly in the fourth year, and during both years is both didactic and clinical.

During the first half of the third year the Junior professor gives two hours a week of didactic lectures, covering rather systematically the gastrointestinal, pulmonary, and specific infectious diseases.

In the second half of this year he gives two hours a week of clinical instruction at the dispensary connected with the college, attempting to demonstrate as far as the material allows the subjects lectured on didactically during the previous term. The other three afternoons in the week the students study personally the cases in the same dispensary under the chief of clinic, being divided into sections for this purpose.

Also during the whole third year, one hour weekly is given to a course in infant feeding by the clinical professor of pediatrics. In this course a full practical training in percentage feeding and the caloric checking of the same is given, so that the students see the actual working of the methods in clinical practice.

In the fourth year the men come under the instruction of the senior professor with a rather firm foundation for him to build on. He gives one hour a week of didactic lectures for one-half year on subjects not previously covered, such as the nutritional disorders, convulsions, and other nervous disturbances, etc.

But in addition he has one clinical hour a week throughout this year training the students to study the mass of material at a large foundling home and hospital which he controls. Here the student has opportunity to see the physiological and pathological conditions of infancy and early childhood in their many phases, thus rounding out the previous didactic and dispensary instruction.

Such has been our course in the past, but I cannot close without announcing with pleasure two marked advances that the school has just taken. First, the St. Louis Children's Hospital has been affiliated with the medical department of the Washington University, and a staff has been appointed with the object in view of using this hospital for teaching purposes. Last year

this Hospital had 2483 new patients in its outdoor department, and 867 new patients in its beds, and already the students are being instructed here.

In a year from this fall Washington University is to have the unique distinction among American colleges of a paid professor of pediatrics, not engaged in private practice, but devoting his best energies to teaching and to research work in pediatrics, and to increasing our knowledge in this specialty. We are all enthusiastic over the possibilities that this advanced step opens, and feel that it means the development in St. Louis of a center from which must emanate in the future much valuable investigation in the various problems connected with the chemistry, the physiology, and the pathology of infancy and childhood, and tac as a training school for pediatrics such as does not now exist.

DR. J. R. CLEMENS presented a child presenting unusual symptoms.

This little girl is A. M., age two years. Feverish and upset in December, 1909. A similar attack in February, 1910. Toward the end of latter illness child was noticed to be unable to hold up its head and began to complain of pains in hands and feet which gradually grew more severe. The pains were sudden of onset, of short duration, and shock-like in character. The child screamed as hands reddened and cramped, and during the seizure held its arms uplifted. When asked where pains were, the child would flex fingers. There were four or five such attacks a day, extending over a period of six weeks. No attacks occurred at night. Exposure to the air made the hands more swollen and red. During the acute attack the hands became redder and felt colder to the touch; as they grew warmer their color paled.

On two occasions the mother noticed the diapers were stained a light red. Later examination of urine negative.

DR. ABRAHAM JACOBI, New York.—The President wishes me to sum up this case, but there is not much to sum up. There is an absence of positive symptoms, yet if there were no symptoms the child would not be considered sick. There have been some symptoms, those which belong to circulation and to the peripheral circulation only. There is no heart murmur. The only positive symptom is the swelling and redness of the hands and feet. There have been no other symptoms of disturbance of the circulation and no symptoms belonging to [the nervous system. So we have absolutely nothing but the swelling and redness of the outlying part of the circulation. What is that due to? I don't know. But the diagnosis is not complete. I have seen cases where the circulation was disturbed due to an incompetence of the heart. There is such a thing as congenital smallness of the heart. We

may find such a condition even among adults with disturbance of the circulation such as we have here, with redness, swelling and coldness of the extremities. The smallness of the heart with the very low blood-pressure could be determined only by continuous examinations. There have been no symptoms relating to the nervous system and no disease that was permanent. The mother says that the child could raise its head, so the fact of its not doing so was merely apparently a certain amount of indolence on the part of the baby. Where there is no circulation there is no blood and where there is no blood there is no nutrition and where there is no nutrition there is no energy. I am not prepared to come to any other conclusion than that there is an incompetence of the heart. What I say about the smallness of the heart is merely a suggestion, but it would explain the symptoms.

Question.—Would that explain why these symptoms came on when the child was nearly three years old and then disappeared?

DR. JACOBI.—These symptoms came on in January; they lasted a while and then disappeared and then came on again. A study of all the nutrition of that baby would explain why these symptoms would come on, and after awhile disappear and again return. Probably when the child's general strength was depressed these symptoms would make their appearance.

Question.—How account for the relief of pain by holding the hands up?

DR. JACOBI.—Because when the hands were held up the blood would flow out and the congestion be relieved, just as you relieve congestion in the head by placing the head high. It is not unusual when an apoplectic person's body is raised, so that there is a flow of blood from the brain, for relief to follow and there may be even some return of functional activity. The mother says that this condition occurred both in the morning and afternoon and less in the evening. I cannot say that I strike the direct explanation when I direct attention to the fact that in every human body the temperature is lower in the morning than it is in the afternoon. There may be connection between this fact and the appearance of these attacks in the morning and their disappearance in the evening.

DR. THEODORE ELTERICH.—What would be the possibility of Reynaud's disease?

DR. JACOBI.—It reminds me of Reynaud's disease certainly. There was merely a discoloration amounting to cyanosis and it may have been a mild form of Reynaud's disease.

DR. CLEMENS.—When the pain is gone the hand is pale, a condition that is the opposite of the condition in Reynaud's disease.

DR. JACOBI.—Yes, but it is due to the disturbed circulation, and I should like very much to know how competent that heart is. It ought to be now two and a half times as large as it was

at birth. The volume of the heart increases considerably until at the fifteenth year the increase is such that it is twelve to twenty times the size it was at birth. Even the aorta becomes at puberty three times its original size. The low state of the nutrition would speak to me of an incompetency of the heart's action and a disturbed circulation.

DR. A. C. COTTON, Chicago.—The appearance of the skin and the condition around the nails, etc., remind me very much of a case I have at the Presbyterian Hospital and about which we have been guessing for about eight weeks. The mother has been delivered of seven children, six of which are now living, and the family history is absolutely negative, but we have had three Wassermann tests, all positive. Though rather a precocious child, it has shown some deterioration of mentality.

DR. CHARLES DOUGLAS, Detroit.—The child's nutrition is wrong and if that oatmeal were taken away from her and a less fatty diet used it might relieve the faulty nutrition. It might be that it was a disturbance of the diet or a malarial infection responsible for the condition during the day. The fact that there are three stools a day shows that there is a faulty diet and she won't improve as long as she has three stools a day. Evidently this neurotic condition of the hands is due to something and if she were my patient I would take her off that diet.

DR. CLEMENS, in closing.—Possibly the explanation of the condition being relieved at night was that the child's hands got cold during the day and that caused the pain and at night the hands were kept warm. There was never any trouble at night when the child's hands were warm. She was in the house at least, even if not in bed, during the early morning and the evening hours.

DR. JOHN ZAHORSKY presented a case of

LITTLE'S DISEASE.

Two or three physicians have seen this child. You will think this is a simple cerebral condition but it presents certain interesting peculiarities. She is three years of age and was born after a hard instrumental labor and afterward had convulsions for three or four days. She could sit up at six months and used the hands very well and seemed to be thriving well. When a year or more old she began to have acute febrile attacks and with each such attack she had convulsions. She would get rigid and remain rigid for several days and with each attack she became more and more helpless. I first saw the child several months ago. The peculiarities are that it gets repeated painful contraction and there is a cerebral diplegia. Trousseau's sign has been found again and again, and Erb's sign. Sometimes the pain is so severe it takes large doses of narcotics to quiet the child. Sometimes the child seems to become unconscious. These febrile attacks have never been explained. I have examined the blood carefully and

it has never shown any evidence of malaria and it has been given repeated therapeutic tests by different physicians. These painful contractions and the fact that the child has become more and more helpless are peculiarities. While there is quite a little depression over the left mastoid process and an optic atrophy in the left eye, yet this cerebral condition does not explain the painful contractions.

DR. CLEMENS, St. Louis.—The symptom known as Trousseau's was present on several occasions. I watched the baby carefully one day and after a sudden eructation the muscles relaxed and pain disappeared.

DR. ISAAC ABT, Chicago.—From the general appearance of the child I should say that the baby suffered at birth a severe general cerebrospinal hemorrhage, a subdural hemorrhage that at last found its way into the spinal meninges, and now it is suffering from a general spinal degeneration. The explanation of the pain and the severe choreiform movements with athetosis might be a lesion of the posterior spinal root. I think it is a severe type of Little's disease with both motor and sensory phenomena.

DR. JACOBI.—Has she tried to walk?

NURSE.—Yes.

DR. JACOBI.—Did the baby take the breast the first day?

NURSE.—Yes.

DR. JACOBI.—Did the mother take chloroform?

NURSE.—No.

DR. JACOBI.—Do you know whether the baby cried immediately after it was born?

NURSE.—I do not know.

DR. JACOBI.—Does the baby know you?

NURSE.—Yes.

DR. JACOBI.—During the forceps operation there was an excessive hemorrhage. We know that hemorrhage in the newly-born are apt to be extensive as the coagulability of the blood is less than it is later; so the hemorrhage extends sometimes over the whole surface of the brain and into the canal. It strikes me that the head is unusually hard for an undeveloped baby of that age. The fontanel is closed up but the forehead is narrow, and there may be a little more still than hemorrhage to account for this condition. It looks to me as if the anterior hemisphere were also undeveloped, so the prognosis is not good. The symptoms all belong to the nerve centers, just as the doctor has described.

DR. S. R. ROWLAND, Detroit.—With that extreme spasticity, what we have to do is to relieve those symptoms. Will surgery relieve the pain or is the condition too general to be relieved by surgery? I would ask Dr. Kelly about that.

DR. S. W. KELLEY, Cleveland.—With such a general involvement as this I do not believe we could relieve the pain or effect very much the condition of the child by means of surgery.

DR. ZAHORSKY.—A question that arose was whether there was any tetany in this case and so we tried calcium lactate, careful diet, intestinal asepsis, etc., without any apparent influence.

DR. JOHN ZAHORSKY also presented a case of

PYLORIC STENOSIS.

This baby is three months old, was born after a normal labor, is breast-fed, and showed no symptoms until it was four weeks old, when it commenced to vomit. The vomiting persisted and got very severe and the child became emaciated. I saw the patient when six weeks old. It weighed eight pounds at birth and now it weighs six pounds. They tried various foods and it threw up everything. On examination I found a very much enlarged stomach and marked peristaltic waves and the diagnosis of pyloric stenosis could be very readily made. Its condition is so much better that I am afraid you won't be able to see the peristaltic waves. I want to mention one or two therapeutic points not mentioned in the text-books. Visible peristaltic waves are characteristic of pyloric stenosis. The disease is comparatively frequent and we see two or three cases every year at the hospital. We have had four cases here within the last year. You know there is inconsiderable discussion whether these cases should or should not be operated upon. This was an extreme case and we thought it would die during the night, yet it has gained three pounds in weight, and while the stomach is still dilated a sufficient quantity of food passes through the pylorus so that it continues to gain in weight. The movements now are very good. These cases of pyloric stenosis, though hypertrophic, will usually recover under careful treatment, so immediate operation is not usually indicated. Another point is that gastric lavage is very helpful. In addition to that three hours after every feeding the stomach-tube is introduced and every particle of food is removed. The third point is to feed these patients by the stomach-tube. The sucking and swallowing during nursing seems to increase the contraction of the pylorus. We use foods that make as little coagula as possible. They usually have very little hydrochloric acid and the gastric digestion is very slow as there is usually some catarrhal condition present. We give them whey, thoroughly peptonized milk, and a little later condensed milk. At present this baby is getting oatmeal water and condensed milk. It appears that after a few weeks or months the pylorus seems to relax and sometimes rather suddenly and with this relaxation the patients get a diarrhea. The only explanation seems to be that there are large quantities of bacteria that get into the intestine through this relaxed pylorus, or else the intestine not having had much to do for several months rebels when the extra work is thrown upon it.

DR. E. H. BARTLEY, Brooklyn.—I have had three such cases

that recovered and I emphasize the importance of reducing the fat in the food, bringing it down to 1 per cent. The lower the fat the better. I think, too, I have received good results from belladonna. Atropine is sometimes employed in obstruction of the bowel, given in large, in fact poisonous, doses. I therefore have used two or three drops of the tincture of belladonna per rectum until I got the physiological effect, and I have seen immediate results from this paralyzing treatment and I have seen stools appear after one or two such doses when there had been no stools for several weeks. I believe the two points I have settled upon in the treatment are the low fat and the belladonna. I have used lavage and gavage and I have thought that using the lavage too often has irritated the stomach. I got better results using lavage twice a day.

DR. FRANK P. GENGENBACH, Dever.—I would like to emphasize the fact that in these cases the food should be of very low fat content, and if you can get any food to pass through the pylorus, in other words sufficient food to keep the baby alive for three or four months, the spasm relaxes. If you can get them to that age you can usually save them. Huebner has advised using a little bit of opium occasionally and a little valerian.

DR. E. H. BARTLEY, Brooklyn.—In one of my cases the nurse by mistake gave the baby two drops of the deodorized tincture of opium. It was given one drop and after two hours was given a second drop and that baby did not vomit for twenty-four hours.

DR. S. W. KELLEY, Cleveland.—It is pretty well understood that the condition may be either a real hypertrophy or in other cases a slight hypertrophy with some spasm added. A curious thing in this connection is that in cases that are operated upon the hypertrophy remains; the irritation having ceased and the cause of the spasm being relieved, the tumor may still be felt. It makes a good deal of difference whether the surgeon knows anything about pediatrics, because when such cases are taken to a surgeon he usually advises prompt operation, whereas by careful feeding and management operation can usually be avoided. The use of bismuth you are familiar with, the *x*-ray showing how far the shadow extends and the demonstration of food passing after operation in the same manner. Bismuth soothes the catarrhal mucous membrane so that spasm is not excited and small doses of opium quiet the spasm.

DR. ZAHORSKY.—I have used belladonna in several cases. In one case I got a brilliant result but never could in any other case and so I have quit using belladonna and opium unless some other symptom indicates their use.

DR. GEORGE M. TUTTLE presented a case of

PYELITIS WITH PERINEPHRITIC INFLAMMATION.

This is an interesting case of not an unusual disease and it is interesting especially on account of an error made in diagnosis.

The child was sent to the hospital on May 19 with a history of appendicitis and asking us to operate. The history was about as follows: She had an attack of pain on May 13 in the region of the spleen, then she began to vomit and the pain became localized in the region of the appendix. On May 19 the doctor advised that she be removed to the hospital for operation. When she entered the hospital her temperature was 103.8° , pulse 82, and respiration 34. On the next day her temperature kept up until evening, when it went down to 99° . The next day the leukocyte count was 13,850, temperature 103.6° , and pulse high. There was very marked tenderness on both sides of the abdomen, running through to the loins. The tenderness was decidedly more marked on the left than on the right. The child had a vaginitis. We had the urine examined and found pus. It was cloudy, flocculent, acid urine. I concluded it was a pyelitis, possibly a pyelonephritis. She was put on urotropin. The leukocyte count was then 26,800. The child went through the characteristic temperature, characteristic until the condition suddenly entirely cleared up on the right side and she began to develop a mass through the entire left quadrant of the abdomen. It was extremely tender and could not be definitely mapped out, but there did not seem to be anything in the loin on that side. It seemed reasonable to suppose that the infection in the left kidney had probably extended to the surrounding tissue and I think the spleen and possibly some coils of the intestine were bound up in the mass, but with an ice pack and keeping her on urotropin it cleared up. I have never seen a perinephritic inflammation following a severe pyelonephritis and the tenderness extending backward. I brought her here to call attention to the ease with which a diagnosis of appendicitis may be made in such a case.

DISCUSSION.

DR. ABRAHAM JACOBI, New York.—Was the whole abdomen painful?

DR. TUTTLE.—No, not down below. It ran up rather than downward.

DR. ZAHORSKY presented a case of

MYOTONIA CONGENITA.

This little boy came under observation when he was a year and three months old. He was well fed. There was no evidence of rachitis, or very slight, but he could not walk. In this child there is no rigidity of the arms; on the other hand, everything is very flaccid. The patellar reflex is diminished. He has been at the clinic a year and is therefore now two years and three months old. The development in every way seems to be perfect. The only symptom seems to be the inability to use his muscles. It is a case of myotonia congenita, or Oppenheim's disease, a condition that is very rare in this country.

DR. JACOBI.—What is the effect of electricity?

DR. ZAHORSKY.—There is no reaction to electric stimuli.

DISCUSSION.

DR. A. JACOBI, New York.—The question is whether those muscles will ever reach a fairly normal condition. I think the best report on this subject has been presented by Henry Hunt on *myasthenia gravis*. Has this patient improved?

DR. ZAHORSKY.—Very much.

DR. JACOBI.—Some do not improve but if you keep this child under your care for the next three or four years it may improve. I believe we are very apt to be satisfied with a bad prognosis in these cases. We are very much inclined to give up these cases where we cannot have a perfect cure, but there is much that may be done in the improvement of the nutrition and by the electric current. Such cases will do better if subjected for a long time to remedies that are known to be nutritive. Muscular tissue can be fed by such remedies as phosphorus and arsenic. I should keep that child for years on arsenic and phosphorus, giving 2 minims of Fowler's solution three times a day, then phosphorus. The phosphates are absolutely useless, but phosphorus will do good in such cases given several months in succession, then discontinued awhile and then given again; but the arsenic you can give year in and year out. The phosphorus I employ is that given in the pharmacopeia of 1890. It is a good preparation of the elixir of phosphorus and one that keeps. It was not mentioned in the next pharmacopeia. I think a number of good preparations were thrown out of that pharmacopeia because they were so handy and useful. The commission, you know, is made up largely of apothecaries.

DR. FRANK P. GENGEBACH, Denver.—The case I saw died of pneumonia because of the failure of the muscles of respiration to respond to the increased tax upon them. The Germans get the best results from 1/100 grain plain phosphorus in cod-liver oil.

DR. M. J. LIPPE, St. Louis.—This baby had pneumonia and recovered.

DR. ZAHORSKY presented a case of

CHRONIC MYOCARDITIS.

This boy is ten years old. He has had frequent fainting spells. They come on usually while he is out playing and running around. There is no spasm or jerking. There is a tachycardia and an extreme cardiac irregularity, such as we find in old people with a senile heart. Some of the heart beats are very strong and others are very weak. The diagnosis is chronic myocarditis of obscure nature or an adhesive pericarditis. I would like your opinion. No cardiac tonics have had any effect upon the pulse.

DISCUSSION.

DR. ABRAHAM JACOB, New York.—The heart should be examined with the pulse. There are two or three contractions to one contraction of the artery, so the two should be examined together. It is a tachycardia, but the pulse is so slow that if you examined the pulse only you might call it a bradycardia. This delirium of the heart, or tumultuous action of the heart, makes it a very interesting case. How old is the history of that case?

DR. ZAHORSKY.—There have been attacks of syncope for three years.

DR. JACOB.—There is no history of typhoid or diphtheria?

DR. ZAHORSKY.—No.

DR. H. N. McCLANAHAN, Omaha.—Any clubbing of the fingers?

DR. ZAHORSKY.—No.

DR. JACOB.—What is your diagnosis as the result of your observation of two months.

DR. ZAHORSKY.—Either chronic myocarditis or adhesive pericarditis, but I do not know that my diagnosis is correct.

DR. JACOB.—I should rather think that the diagnosis of a faulty myocardium is the correct one. It need not be inflammatory. It follows an infectious disease, usually diphtheria, not infrequently pneumonia or influenza. This irregularity of the action of the heart when it cannot be explained except by disease of the heart is always of that character. It is true that there is an arrhythmia of the heart that may be due to constipation or the emotions, but this delirium of the heart can be explained only on the ground of a nervous disturbance or defective heart muscle. If that boy is put to bed and kept there for six months without permitting him to get up for a moment, and keeping him in good air, the heart action may become normal.

DR. ZAHORSKY.—He has been kept in bed and I hope he will stay there.

DR. J. FINLEY BELL, Engelwood, N. J., read a paper on
SCARLET FEVER.*

Monday Evening Session.

DR. THEODORE J. ELTERICH, Pittsburgh, read a paper on
PURPURA.†

DR. JOHN ZAHORSKY, St. Louis, read a paper on

RECENT PROGRESS IN PHYSIOLOGICAL CHEMISTRY OF INFANTS.‡

DR. EFFA V. DAVIS, Chicago, reported the

RESULTS OF INFANT-FEEDING WITH MILK FROM CITY-KEPT
COWS.§

* See original article, page 915.

† See original article, page 928.

‡ See original article, page 1101.

§ See original article, page 1106.

DR. CHARLES DOUGLAS, Detroit, read a paper on

METHODS OF FEEDING OF MORE IMPORTANCE THAN CHOICE
OF FOOD IN SUBSTITUTE FEEDING OF INFANTS.*

DISCUSSION OF THE PAPERS OF DRs. ZAHORSKY, DAVIS
AND DOUGLAS.

DR. C. W. VAN DERSLICE, Chicago.—The question of the interval is a troublesome one. Undoubtedly many babies will go for three hours, but the number it is an advantage to is very small compared with those that do well on a two-hour interval during the first month. I have been called in to a number of cases where the trouble was too long an interval and there have been but one or two cases where it was unnecessary to bring down the interval of feeding, so it makes one doubt whether the old way is right. From consultations I have had with men who have adopted the new method I have not had evidence enough to decide me to adopt the method. Dr. Davis had the right idea when she brought the cow to the baby. When you cannot have a good environment for your cow and when you have untrained milkers, yet when you have the milk immediately cooled you do not have much difficulty with the child's growth. I have tried that a good many times and it has always worked well with me. Fortunately I have not made any great mistakes and the babies have always done well. It has been rather expensive, sometimes, when they had to buy two or three cows from the stock yards before they got a good one. I think this idea of Dr. Douglas of feeding the babies when they are hungry will work out all right. I have peptonized the amount of food that should be given and then gradually reduced the peptonization and added citrate of soda.

DR. E. H. BARTLEY, Brooklyn.—One impression left on my mind by Dr. Davis' paper is the importance of careful watching of these babies or the importance of the thermometer, constant attention, and skilled supervision. Some years ago a laboratory experiment was made in feeding and the result of that experiment was that the personal care the baby got was of as much, perhaps more importance than the kind of food given it. That was the result of a carefully conducted series of experiments extending over one summer. In the case of institutional children we will notice that they never thrive without their mothers. Mothers' babies always thrive better than the babies without mothers. They are fondled and moved about. Take the babies in the institutions where there are few nurses and the babies are left lying still for twenty-four hours and they do not make the progress that those do who get the mothering that they do in the home. In private families where the children get a fair amount of care then the question of the amount of food

* See original article, page 1110.

shows, but in institutional cases you cannot make much impression unless you have enough nurses for the babies to receive the necessary care and attention.

DR. BELL.—Dr. Davis is to be complimented on having converted what was a fancy into a fact. Two or three years ago everyone would have laughed at the idea of bringing a cow into the city. I was also interested in her failure with the goat. I had a goat whose milk was 6.5 per cent. fat and with proper dilution it agreed with the babies. With an imported goat with less fat I found that they did not do well and this was found to be due to a difference in the character of the fat. As to the difference in the Jersey and Holstein cows, in the Holstein cow there is a larger amount of concentrated fat, of insoluble fat. The olein is diminished relatively to the amount of stearin. A goat can be adapted to life in the city just as dogs can be kept and a Swiss goat gives considerable milk. I have two, one with a record of five quarts and one with a record of four and a half quarts when fresh. However, I believe a cross between the Swiss and the native goat will give the best milk for the infant.

DR. J. ROSS SNYDER, Birmingham.—The success of Dr. Davis with the city-kept cow can be accounted for by the freshness of the milk. Then there is the effect of the herding of cows. We know that this has some effect on the nervous system of cows. A cow kept by itself will give more milk than those that are herded. Recently in a conversation with a gentleman who had supplied most of my babies with milk from four cows I told him I had not been getting as good results as formerly. He had decided to enlarge his dairy and I believe that the herding of the cows had something to do with it. I would like to ask Dr. Davis if she has noticed any more cases of milk idiosyncrasy in her studies. I was interested in that when she reported her cases in New Orleans.

DR. HOLMES, Detroit.—What is needed is the education of the mother that she must nurse her child if possible and where that is impossible that she must have fresh milk for the child. I think that is the secret of many of these good results; that they are due directly to education.

DR. A. C. COTTON, Chicago.—When I was a boy it was believed that the best cows for butter-making were those that grazed in the valley and those that grazed on the hills were the best cheese makers.

DR. G. H. CATTERMOLLE, Boulder.—It is my custom in the purchase of a cow when the family needs it for sick children, to buy Jerseys because they are gentle and can be kept in the front or back yard. Ordinarily a cow is taken untried. We tell them that we will try the cow for a week or ten days and we say that we will give five dollars more for the cow if it is satisfactory. During that time we give them the tuberculin test. Very often they go back. You may get your best cows from the dairy if you examine them yourself. The Jersey cow, if you modify

the milk properly, makes a very satisfactory animal to keep in the yard.

DR. E. H. BARTLEY, Brooklyn.—I was interested in the statement that the cow Dr. Davis had best success with was a Holstein. I have been convinced for a long time that the cows giving a large percentage of fat are not suitable. In the preparation of certified milk it is sometimes hard to keep the fat down. I have always held that 4 per cent. of fat is far better than 5 per cent. of fat. They sometimes mix the grades in the same dairy but I have found that in the same dairy on the same day ten bottles of milk from the same grade showed a difference of 1 per cent.

DR. H. W. CHENEY, Chicago.—I have not had any experience with cows, as we have had a good grade of certified milk, but I do agree with Dr. Davis as to the long intervals between the feedings. You will have much less crying among babies if they are fed every four hours, and I feed sick babies the same way.

DR. BELL.—I have come to the conclusion that the Jersey and Gurnsey cows are unsuitable. A dairy composed largely of Holstein cows serving milk for babies gives a much better result. The Jersey is a very nervous cow, while the Holstein and Durham cows are more placid and less likely to be disturbed.

DR. ZAHORSKY, in closing.—I give warning that some of us younger men should be very slow to modify what experience has taught us just on the basis of a few chemical analyses. One point in Dr. Davis' paper I want to refer to. In breast-fed babies we have two forms of dyspepsia, one is the ordinary flatulent colic, "gas on the stomach," as it is called. The other form is diarrhea. The text-books state that the colostrum of mothers' milk has laxative properties, but it is not unusual for these babies to have diarrhea for two or three weeks, having very irritating properties, inasmuch as the stools excoriate the buttocks and there is sometimes a colitis. I have kept these two forms of dyspepsia in mind. I have tried to find some method of dealing with this. The diarrhea will usually disappear, but we do not know why the baby should have the colic. The usual explanation is that the baby gets too much milk, but sometimes if you give them only an ounce they will still have colic on certain milk. It is difficult to limit the baby to just the quantity you want the baby to take. I recall two babies who had a severe dyspepsia on mothers' milk. These babies were weighed before and after nursing and it was found that they were taking too much, so the length of time of nursing was cut down from twelve to eight minutes, but we soon found they were taking the same quantity, *i.e.*, three ounces. Then we cut the time down to four minutes and even then they got their three ounces of milk. They worked just that much harder, for they seemed to realize that they were to be taken from the breast. By keeping up that

method for several days it does not give the result. Sometimes they have their stomachs filled with lime water before nursing, but the severer cases do not yield to this. So I am willing to be taught what is a good method to relieve babies of this condition. We see again and again infants that are apparently thriving that have excessive pain in the intestinal canal and all efforts to improve that condition are fruitless. I have had an analysis made again and again, but the only way to do that is by taking all the milk in the breast. If the milk is taken at the onset of nursing, of course it has only two per cent. of fat, but that does not really give us the composition of breast-milk, so the ordinary clinical examination of breast-milk does not tell us whether it is abnormal in its contents. I wish we could get at the actual cause of this trouble. We are still working just as we did thirty years ago with the ordinary baby, with the ordinary flatulent colic, or the ordinary diarrhea. As to green stools, there is one variety of green stool that seems to be normal, that is a mixed green and yellow and some days it will be markedly green. It is due to the change of bilirubin into biliverdin, but just why this occurs I do not know. The green stool in itself does not amount to anything and I advise the mother to let it go. A most common mistake is to mistake hungry green stools for the green stool of indigestion. Then there is the green stool that sometimes occurs in artificial feeding. The green stool in breast-fed babies is usually perfectly harmless.

DR. A. C. COTTON, Chicago.—There is more in the practice of medicine than science, and these mothers whose children get diarrhea bother the doctor about it until I used to give those babies with green stools a little rhubarb to make them yellow. The chances are that these babies will go along for a long time and gain in weight and everything is lovely except the mother's mind.

DR. DAVIS, in closing.—I have some ideas on green stools that may answer Dr. Snyder's question on idiosyncrasies. In my opinion green stools come if the nurses or attendants are not clean about washing the mother's nipples. I think many are due to infection. If I have a careless nurse, if that is corrected the green stools disappear. If the child is fed exactly right it will overcome the germs on the nipple, but if it is a delicate child or is overfed you will get the green stools. Since reporting those types of idiosyncrasy in New Orleans one of those mothers has had a second child. As it came after I had had four more years of experience I felt more courageous, and the mother felt less alarm as it was her second child. The mother was toxic in both cases. In the first case we weaned the baby in six weeks as I did not know what else to do. In the second case the mother was more toxic but the baby was more robust and we had a trained nurse in charge, but at the end of three weeks the baby began to have colic and green stools. I told the

mother I wanted to experiment. I took a wet-nurse I knew to be absolutely healthy and her own children thriving. Her child was but a few weeks old. They changed babies and the big healthy baby took this mother's milk and thrived and the weak baby took the wet-nurse's milk and thrived. After two weeks we put the delicate baby back to its mother's breast and it continued to thrive. Those toxic babies are many times the crying babies and have green stools. Overfeeding and unclean nipples has something to do with it. As to the interval of feeding I believe if the balance were used more systematically you would know more about the interval of feeding and about what was normal and what was not normal, if you had these record charts before you, especially if you have a trained nurse and can keep these records for a month or two. It is a question what the child takes in twenty-four hours, and when a child commences to take as much as three ounces at a feeding he is almost sure to have colic, diarrhea, and excoriated buttocks. Sometimes they will gain in weight, but they will be cross babies. I am just as sure of this as possible and all I can say is weigh your babies, study them for a week or so, and study a large number of babies.

The Holstein cows I think are very desirable in every way. They are gentle and can be kept quiet and have not a rich milk. I find that young babies will do better on 2 1/2 per cent. of fat quicker than they will on a larger amount of fat. That premature baby of an eclamptic mother I think could not have been kept on milk of a higher percentage of fat. The older babies after nursing was established would go from this 3 per cent. of fat to milk containing 4 or 4 1/2 per cent., but the delicate babies do not do so well. I also found that peptonizing it helped us over the hard places.

DR. COTTON.—Dr. Zahorsky states that the babies have green stools when they are hungry and Dr. Davis says that when they get too much they have green stools. When I was doing obstetrical work I had one patient who had five girls. Finally she had twins, a boy and a girl. The girl was small and probably was neglected and the boy was large and strong and got more milk. First the girl got green stools and then the boy two or three days later got green stools. Now I know what was the matter: the girl had green stools because she was hungry and the boy had green stools because he was overfed.

DR. DAVIS.—I agree with Dr. Zahorsky that green stools do come from starvation sometimes. Those twins may have had some toxic condition. I think the mother seldom carries twins to term without some form of toxemia, and I think that was probably the cause. They were more or less affected by the mother's toxemia.

DR. DOUGLAS, in closing.—About the weight of evidence against the cream in the Jersey's milk, that does not hold true. The creamery in our city gave me a book they kept in which they paid for the milk by its weight in solid constituents. They

gave me the books showing the analysis of milk of different cows of different breeds. The Jersey was high in both fat and proteids. The Holstein milk would run down to 8, 9 or 10 per cent. solids. The Jersey had as high as 15 per cent. and the fat went up in proportion, so we cannot charge it all up to the cream. They were selling Jersey milk of 4 per cent. cream. A man that runs a dairy buys a good cow, no matter whether she is red, black, or blue. It is their practice when they have a cow giving over 4 per cent. of cream to buy Holsteins giving milk of low specific gravity and even it up in that way. Dr. Rotch told me of the great advantage of Holstein milk and after his teaching I applied to this creamery to give me Holstein milk for my children. I had them buy a Holstein cow and I fed it very faithfully, and I must say that after two or three years' trial I was not impressed with its superiority over other milk. I separate the cream from the milk always and then bring them together, putting in so much sugar and so much fat according to what the child can digest comfortably. That explains why I do not get much difference in the results. You must dilute the Jersey milk. As to green stools, there is no doubt we do get green stools from starvation, but when the babies are starved they have little green stools and when they are overfed you have big stools that are all green. That is what I have trouble from. I have seen babies on mother's milk that had green stools in pieces the size of a fifty-cent piece. Taking that child off the mother's milk, it became healthy and comfortable and as soon as it is put back on the mother's milk it has green stools. When you get a stool that is watery you have got too much sugar, but what you have in the green one I do not know. But if you can't stop it you will have to wean your child. I have seen those children break out with a papular eruption showing the toxic condition. Where they do not have too much green I feed the baby partly on the bottle and partly on the breast. I have taken a child from the mother because it had green stools and put it to a wet-nurse whose child had yellow stools and yet that child on this milk had green stools. I think these children are born that way, just as they are born without hair. They probably have not the digestive power that they have later.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Experiments on the Action of Sugars in Artificial Feeding.—Angiola Borrino (*Riv. di Clin. Ped.*, August, 1910) has made an extensive series of experiments as to the action of sugars of various kinds in the artificial feeding of infants. He finds that the rapid increase in weight observed on adding sugars to mixtures of milk corresponds to a lessened elimination of water by the kidneys, due to the presence in the organism of products of assimilation of the sugars absorbed. It is not possible to state whether the elimination of sugar by the lungs and skin is also diminished. The difference in the increase of weight with different sugars is due to the difference in the quantity of liquid eliminated by the kidneys; the greatest increase of weight and least elimination of water is with maltose and saccharose, and may be attributed to the easier assimilation and absorption of these sugars. Lactose is less absorbable. The other sugars cannot be as long tolerated without causing disturbances. This sugar has an important action on the intestinal movements and the prevention of putrefaction, and acts as a defense to the metabolic processes. Maltose combined with alkalies has shown itself the best sugar for administration in atrophic children. Saccharose is well tolerated by many children in methodical feeding; but lactose is the most generally applicable to artificial feeding of infants.

Bad Results of Hypoalimentation in Nurslings.—Luigi Concetti (*Revista di Clin. Ped.*, August, 1910) describes a condition resulting from hypoalimentation which is similar in symptoms to that resulting from too much food, and is often mistaken for it. Vomiting occurs from emptiness of the stomach; the stools are thin, green, and fetid; the child is restless, crying, and sleepless, and death often comes by convulsions. The symptoms only cause the practitioner to lessen the amount of nutrition, diluting the milk still further and filling the stomach with water. The same condition exists in cases in which the mother's milk is deficient in quality or quantity, or the weak child is unable to draw it from a badly formed nipple. All medicines fail to ameliorate the little patient's condition; laxatives, astringents, digestives and calming drugs all fail. Only addition of more nutriment aids the child. The author gives illustrative cases. He uses in addition to increased nutrition a solution of the digestive ferments, pepsin, pancreatin and amylase, will lecithin, lactic and hydrochloric acid, in water and alcohol.

Nutrition of the Feeble Infant.—H. D. Chapin (*Jour. Amer.*

Med. Assn., 1910, lv, 1455) describes the findings in twenty-one cases of malnutrition with reference to the time required for the stomach to empty itself. He concludes that in a large majority of cases the feeble infant with digestive disturbances is fed too frequently. Regarding the method of feeding in difficult cases, he favors individualizing, aided by experiment, if necessary, rather than close attention to the calculation of theoretically indicated mixtures. He has tried Finkelstein's method of feeding in twenty cases, most of which had not been doing well on ordinary food. Finkelstein believes that instead of the fat or protein being the usual cause of trouble, most digestive disturbance is caused by the milk sugar. The principles of his method of feeding are: (1) the cutting down of the amount of milk-sugar and of the salts; (2) in place of this, casein is added and a not inconsiderable amount of fat; (3) a further bettering of the condition is sought by substituting other forms of carbohydrates for the milk-sugar, which tends to an increased tolerance. The food is prepared by separating the casein and fat from one liter of milk. The curds are pushed through a sieve to break them up and then added to half a liter of water. Half a liter of buttermilk without sugar is then added to the mixture. One liter of this food contains the whey and sugar from half a liter of milk, the casein from one and a half liters and the fat from one liter. A small amount of fat and casein are lost in its preparation, but the following are estimated as the percentage ingredients: protein, 4.5 per cent.; fats, 2 to 3.5 per cent.; sugars, 1.5 per cent.; salts, 0.3 per cent. When the writer's twenty cases were put upon this food they were fed every four hours, day and night, and the food was usually given in lesser bulk than in the previous feedings. Water was given freely between the feedings. The stools generally become gray and homogeneous with a putty-like consistency and dry appearance. There was usually then a tendency to constipation. The results in this series of cases were not very promising. Altogether, eight patients gained slightly in weight and twelve lost in weight on the Finkelstein feeding. It seems that when benefits follow this method of feeding, the results are due more to the form in which the protein is given, the casein being in a very finely divided state, than to the lessened amount of sugar in the mixture. The food appears in some cases to check the rapidity of atrophy temporarily and hence may have a restricted usefulness. Judging from the character of the stools it may also act well in certain forms of diarrhea.

Babinski's Sign in Diphtheria.—Babinski's sign was found by J. D. Rolleston (*Rev. Neurol. and Psychol.*, July, 1910) in 19.6 per cent. of 877 cases of diphtheria, the character of the response being rapid, deliberate, or intermediate in character.

The extensor response in diphtheria is not confined to infants, but may be obtained, though with decreasing frequency and duration, especially after the eighth year, until adult life.

It is essentially a phenomenon of the acute stage, in most cases being replaced by flexion in convalescence. Transition stages often exist in which various forms of response may be obtained.

Babinski's sign is not pathognomonic of diphtheria among the acute infections, since it occurs in typhoid fever, scarlatina, lobar pneumonia, and probably other acute diseases; but its greater frequency in diphtheria than in non-diphtheritic angina accords the sign a certain diagnostic value.

It is more frequent and persistent in the severe than in the mild forms of diphtheria, as is shown by the character of the angina, the higher mortality, and greater frequency of paralysis and albuminuria among the cases in which it occurs. Its presence has, therefore, a certain prognostic value.

It is not associated with any special condition of the tendon jerks, and is never accompanied by ankle clonus.

It is probably due to a transitory perturbation of the pyramidal system by the circulating toxins, comparable to the slight degree of meningeal reaction which is a frequent occurrence in acute infections.

Serum Treatment of Hemorrhagic Disease of the New-born. E. B. Bigelow (*Jour. Amer. Med. Assn.*, 1910, lv, 400) records three cases, two of them apparently moribund, successfully treated by injection of 5 c.c. of rabbit serum immediately after it was obtained from the animal. The most impressive fact in each case was the almost immediate control of the hemorrhage after the administration of the serum. This was shown directly from observation of the umbilicus in the first case, and the nose in the third, while indirectly in all three by the absence or marked diminution of normal blood in the stools, although for the following two or three days each baby did have a tar-like material in the stool, suggestive of old blood; but no tests were made at the time to prove this.

In the first case this dose was repeated in twelve hours, although there was no sign of a fresh hemorrhage at that time, and it seems to have been uncalled for. The serum in these cases gave absolutely no untoward symptoms.

Therapeutic Use of Sea-water in Infants.—On account of the remarkable results reported by Simon in cases of bronchopneumonia, gastroenteritis, and congenital debility in infants treated by subcutaneous injections of isotonic sea-water R. M. Merwick (*Arch. Ped.*, August, 1910) has employed it in twelve cases of bronchopneumonia, sixteen of congenital debility and nineteen of acute gastroenteritis. The writer says that in looking over the results obtained it cannot be claimed that the subcutaneous use of sea-water has in general any remarkable effects. The subcutaneous use of saline fluid has long been recognized as of great benefit, especially where there is any disturbance of the circulatory system, as in shock or in the disturbances of the vasomotor centers in infectious fevers. Here the normal

salt solution acts as a stimulant, and it is precisely this action which the injections of sea-water sometimes produced. These results can be produced, however, as the writer has convinced himself in some control experiments, with normal salt solution just as well.

Treatment of Enuresis by Reeducation.—The reeducational treatment of tics consists in having the patient perform voluntarily a number of times the muscular action that he performs involuntarily and unnecessarily. Enuresis has been classed as a tic. Applying this method to the treatment of involuntary micturition, Charles Herman (*Arch. Ped.*, August, 1910) has had the patient urinate at regular stated times, but every time he urinates he is directed to void a little, say 2 drams, and then stop; then void 2 drams more and stop, and so on until the bladder is emptied. In this way he exercises the mechanism which controls urination; he trains and educates himself in the voluntarily execution of the act. After this has been done two or three times under the direction of the physician the patient can carry it out himself.

Tuberculous Cavities in an Infant of Three Months.—Collet and Delachanal (*Lyon méd.*, August 28, 1910) give the history of a case that shows that cavities from tuberculosis may occur in an infant outside of involvement of the bronchial glands. The lesions were primary in the lungs, there having been no diarrhea and autopsy showing no intestinal ulcers. The right lung showed a cavity the size of a walnut in the upper lobe and another in the lower, with miliary tubercles elsewhere. The cavities were formed by a rapid pneumonic process, not by the slow fibro-tubercular lesion common in adults. The child's mother was healthy, the father tuberculous, and the child was nursed and fed on sterilized milk. It died with symptoms of an acute pulmonary affection with dyspnea, severe cough, and meningitic symptoms. Miliary tuberculosis was found everywhere.

Operative Treatment of Tuberculous Meningitis.—A. J. Cleveland (*Brit. Jour. Child. Dis.*, Sept., 1910) records four cases in which attempts were made to give relief by drainage of the base of the brain, of the lateral ventricle, and of both simultaneously. After free drainage of the base of the brain the patient died with symptoms of gradually increasing intracranial pressure. In the second case aspiration of the lateral ventricle was followed within an hour by convulsions and screaming. As this was attributed to sudden change of intracranial pressure the ventricle was tapped slowly in the third case. No convulsions occurred for thirty-six hours, but there was no appreciable improvement. In the fourth case both the base of the brain and the ventricle were drained. As there was apparently slight temporary improvement the operation was repeated three days later, but without result. The writer concludes that intracranial pressure is not the immediate cause of death, which must therefore be ascribed to the effect of the inflammatory process on the brain

substance rather than on the meninges only. Operative interference is therefore unfortunately useless.

Congenital Dislocation of the Hip.—E. H. Ochsner (*Jour. Amer. Med. Assn.*, 1910, lv, 1459), in reporting his results in the treatment of congenital dislocation of the hip, says that no case should go undiagnosed beyond the age of three, and that if properly treated at this age the great majority can be successfully reduced and give good anatomical and functional results. He emphasizes chiefly that too great force should never be applied, especially suddenly. In children below the age limit it is rarely necessary, and in children above the age limit there is very considerable danger of doing more harm than good. The reduction should be accomplished by bringing the head over the posterior rim of the acetabulum rather than bringing it around the lower border. This latter method is apt to be adopted if bringing it over the posterior rim proves to be difficult. It is one of the principal causes for the great number of anterior transpositions and also for the considerable number of failures in the hands of some operators. Many of these hips have been considered reduced when, as a matter of fact, the capsule has just been pushed in front of the head, resulting in a transposition without a reduction. If this takes place it is quite impossible for a new joint to be formed, because a portion of the capsule intervenes between the head and the acetabulum, preventing the development of the cotyloid ligament. These pseudoreductions are very deceiving, because the operator experiences the peculiar shock of the head slipping anteriorly, and because a fullness appears in the groin and the thigh becomes lengthened, as shown by the tenseness of the ham-string muscles. When reduction is once accomplished, the hip should never be intentionally relaxed. It increases the difficulty of retaining the head very greatly, because it gives the hip relaxation habit. The ham-string tendons should not be stretched at the time of reduction. Their action is fully as important in holding the head opposite the Y cartilage as is the subsequent weight-bearing. The tenseness of the ham-string muscles is a very valuable sign for the first couple of weeks, as it is almost positive proof that the hip has not relaxed. Overstretching of the ham-string muscles is entirely unnecessary, and being an additional trauma, is dangerous and harmful. If the patients are encouraged to use their limbs as soon as possible, they will always get their legs straight long before the casts are removed and there will be much less likelihood of injuring the vessels and nerves. The cast should be applied over stockinet instead of glazed cotton. If the bony prominences are protected by a little felt or quilted gauze this will be much more comfortable than cotton padding. If stockinet is used the head can be held so firmly that it will not remove even $\frac{1}{4}$ inch. It can thus be kept opposite the Y cartilage until the capsule has had time to shrink and until the cotyloid ligament has had time to develop. The

cast should be applied with the thighs abducted to a right angle and flexed to a right angle, and it should be left in place for a year from the time of reduction with only one change of cast. The period must be sufficiently long to permit proper shrinkage of the capsule and proper development of the cotyloid cartilage. I believe that the development of the cotyloid cartilage is the most important factor in the permanency of the reduction.

Subluxable and Luxated Hips in the New-born.—P. Le Damany and J. Saiget (*Rev. de Chir.*, Sept. 10, 1910) say that there are two great divisions among the causes of luxation of the hip-joint; anthropological and teratological. Anthropological causes are exaggerations of all the influences that affect all individuals before and after birth. Their danger, always greater in the female sex, increases with the elevation of the races. A deformation of the femur, or its torsion, which anteverts the neck, brings about the gravest consequences. As long as the thigh is in flexion within the womb, all goes well; this torsion causes dislocation as soon as the child takes the dorsal position or the upright one after birth. These anthropological luxations are postnatal. The teratological causes are similar to those of monstrosities. Among them are failures in the development of the periarticular muscles of the hip; pelvic malformations; and vicious attitudes. The authors have endeavored to prove that congenital luxation does not exist at the time of birth in viable infants. Their studies showed the existence of a quasi-pathological condition of the hip which is spontaneously curable. This they call "subluxable hip." They also show that most teratological luxations occur in utero. They examined 1722 infants at the Paris Maternity and that of Rennes, among whom they found a single true luxation. They found seven teratological cases. Of subluxable hips they found twenty. This results from the lessening of the depth of the acetabulum during the second half of intrauterine life, which renders the position of the hip unstable. The difficulty of adaptation of the infant to the ovoid uterine cavity exaggerates the bad position. The authors conclude that any anomaly of the position of the lower extremity may cause luxation of the hip in the first half of uterine life. Certain pelvic malformations may cause the same condition. From birth congenital luxations of the hip are frequent enough in children affected with other deformities, especially those of the nervous system, but whose skeletons are normal. The immediate cause of these luxations is dystrophy of the periarticular muscles of the hip. Among new-born infants, especially females, it is quite frequent to find the subluxable hip, which is spontaneously cured. Congenital luxation of the anthropological variety is prepared in the uterus and accomplished at birth. Its pathogenic unity contrasts with the variable etiology of luxations before birth.

Bacteriology of Acute Respiratory Infections in Children.—L. E. Holt (*Jour. Amer. Med. Assn.*, 1910, lv, 1241) reports the

results obtained at the Babies' Hospital from over 1100 cultures from the secretions of the respiratory tracts of over 500 patients and thirty nurses and attendants. The cases were divided into four groups: 1. Those with pneumonia. Most of the pneumonias were of the acute primary type, bronchopneumonia being much more common than the lobar variety. Only a few of the pneumonias were secondary to other infections. A small number were terminal infections in children suffering from marasmus. 2. Those with bronchitis and other respiratory infections, laryngitis, tracheitis, etc. The cases included in this group were for the most part rather milk infections. 3. Those with pulmonary tuberculosis. 4. Those with nonrespiratory diseases. These were surgical patients, children admitted for disordered nutrition (feeding cases) or other chronic diseases, healthy infants, thirty nurses and attendants. What a mixed infection the acute pneumonia of early life is, was shown in a striking manner. Pure cultures were practically never seen, although a single dominant type of infection was present in very many cases. In the first group, the pneumonias, and, in fact, in all the groups, the predominance of the pneumococcus and *Staphylococcus aureus* was noted. The percentage of cases showing the *B. influenzae* fell considerably below that observed in the previous season. The streptococcus was rarely the predominant organism found, although present, usually in small numbers, in over one-half the patients, and about one-third the cultures taken. The probable explanation of this small percentage is that few of the pneumonias were secondary to such infections as measles, diphtheria, etc. That the character of the infection in bronchitis is essentially the same as that in pneumonia is not generally appreciated. In the second group of mild respiratory infections, however, the relative frequency of the different organisms found in cultures was about the same as in the first group, except that the percentage of influenza cases was higher. In the third group, the tuberculous cases, the pneumococcus and *Staphylococcus aureus* still predominated. In the fourth group, nonrespiratory cases, it was not surprising to find the *Staphylococcus aureus* in about 85 per cent. of the patients and of the cultures, and the streptococcus in about one-half this number. It was, however, rather surprising to find that 52 per cent. of the patients showed the pneumococcus, but the season was the winter and spring and the patients were hospital inmates. The proportion of influenza cases falls the lowest in this of any of the four clinical groups; but it was found in 19 per cent. of the patients.

Treatment of Respiratory Diseases in Children at Hot Mineral Springs.—Carron de la Carrière (*Jour. méd. de Bruxelles*, Sept. 12 and 15, 1910) gives a résumé of the medicinal properties of the different mineral springs in France, and their effects in diseases of the respiratory apparatus. Affections of the bronchi, lungs, and pleura may be divided into those which are conse-

quent on the arthritic diathesis, those that are tuberculous, and those which are sequelæ of various disorders of childhood. In cases of arthritis we find an intense irritability of the mucous membranes, with frequent attacks of congestion. When some simple affection appears these patients have an exaggerated congestion and fever, with spasmodic coughs; even true crises of asthma may be seen. In all of these cases the thermal mineral waters are of value. In tuberculous cases we have to fight against the demineralization of the organism, to assist the general health, and stimulate the organism to defense against the bacilli. Here thermal springs which aid the improvement of the general health are useful, the anemic and lymphatic condition are both improved. Waters containing chlorides and arsenic are of value here. In troubles following other infections of childhood thermal springs are of value; such cases as have old pleurises, pneumonias, and bronchitis are much benefited. At Mont-doré the waters are hot, alkaline, and mildly mineralized; at La Borboule they are hot, strongly mineralized, and contain arsenic, and chlorides. Sulphur springs are found at several of the French resorts. The mild alkaline waters produce the effect of sedatives and antispasmodics, removing pulmonary congestion, reestablishing permeability of the air sacs, and rendering the pleura supple. The arsenical waters are for the lymphatic, anemic, and depressed who used general treatment. The sulphur waters are useful as general tonics, local sedatives, and act on atonic muscular fibers, improving catarrhal conditions. The author describes the natural advantages and the methods of treatment used at the various mineral spring resorts, which are utilized to such great advantage in France in treatment of pulmonary disease in children. Mont-doré is delightfully situated at the altitude of 1050 meters, in majestic mountain scenery, with every advantage of fresh air and hygiene. Its treatment is essentially tonic. The two springs are hot, rising from volcanic mountains; the minerals contained consist of bicarbonates of lime, soda, magnesia, lithia, and iron, with carbonic acid gas. Inhalation is an important element in the cure; it is obtained by staying in a large room into which is thrown vaporized hot mineral waters. The children dressed in special flannel costumes play, talk, and walk there. When they leave they change their clothes, are wheeled to the springs where they drink, and than are put to bed for an hour. Thus a local medication is combined with the general treatment. Its effect is sedative, antispasmodic, decongestive, and secretions are fluidified. It is useful in the arthritic and asthmatic. La Borboule is as well situated, at a slightly less altitude, but still among mountains. Its waters are arsenical, and are drunk as a medicine. Inhalation is carried out here, too, by compression of the water at a high temperature, and its division into fine droplets, carried by a current of hot air. The inhalation lasts but a half hour, followed by the same treatment as before men-

tioned. Its action is tonic and decongestive. The secretions become fluidified and their expulsion is facilitated. It is useful in anemic, lymphatic subjects, in children who have anginas, bronchitis, and asthma, in the hereditary arthritic, in the early stages of tuberculosis, etc. Allevard is situated at a low altitude, with highly mineralized sulphur waters. Free hydrogen sulphide is inhaled. Inhalation in the hall consists of breathing cold hydrogen sulphide, carbon dioxide, and oxygen. The respiration is calmed and made deeper. The treatment is sedative and anesthetic, and too great secretion is lessened. The specialty of Luchon is the treatment of suppurations of the upper air passages, ear, and throat. The water is rich in soda and sulphur. Inhalation of hot, sulphur vapor conducted to the ear by the Eustachian catheter, and to the nasopharynx prevents suppuration and deafness.

Plantar Reflex in Infancy and Childhood.—Study of a series of 447 infants and children by E. C. Fleischner (*Arch. Ped.*, August, 1910) with reference to the plantar reflex has shown that the most valuable result can be obtained on single stimulation. Repeated stimuli disturb the child and render the result unsatisfactory.

Babies should always have warm feet if a satisfactory result is to be obtained.

In eliciting the Babinski phenomenon the outer side of the plantar surface should be stimulated, the lightest stimulation necessary for a result being employed.

Eighty-five per cent. of children under one year of age who could not stand showed the infantile reflex, and only 50 per cent. of children over this age who could not stand showed the same phenomenon.

Of the infants and children who could stand but could not walk 75 per cent. showed the mixed infantile and adult phenomenon, 20 per cent. the infantile phenomenon, and in 5 per cent. the result was variable. Of the children who could walk, 55 per cent. showed the adult reflex, 40 per cent. the mixed reflex, and 5 per cent. the infantile reflex.

The so-called Babinski phenomenon is practically of no value in infancy and childhood when the children cannot walk, and is then only of value if one is cognizant of the reflex present before the disease process began.

Tics in School-children and their Interpretation.—G. Paul-Boncour (*Progrès med.*, September 10, 1910) believes that it is an error to suppose that tic in school children exists generally in degenerate, vicious, or weak children, as has been stated by some authors. The writer has made an examination of 1,759 scholars in the *Intituit Medico-pedagogique*, with reference to the occurrence of tic and the mentality of the small sufferers. He finds that the children who had tic were to be found among the average scholars; their conduct was not so bad as had been claimed. Of the entire number examined 417 had tics. He

finds that in very young children tic is rudimentary, and these children frequently have had habits learned at home. It is at about seven years of age that tic begins to increase in frequency, and is present very frequently at about the age of twelve. The proportion of children with tic is equal in the two sexes. At thirteen years their frequency decreases and puberty lessens them. Some of them are intellectually precocious. When a teacher does not interest his pupils it is noticeable that tics appear. Children frequently imitate one another. The treatment is easy in these children; whereas in degenerates it is difficult and ineffectual.

Noma.—Marcel Breuer (*Arch. de méd. des enf.*, September, 1910) has made a study of the specimen from a case of noma observed by him, in an attempt to find a specific cause of the disease. This is a disease that generally occurs in children who have been weakened by some infectious disease such as measles, scarlatina, or whooping-cough. Strange to say, it is more frequent after measles than after the other diseases. This was the condition in the author's case. Here the gangrene involved both lips, the palate, and the nose, and ended in death. Autopsy showed many foci of gray hepatization in the lungs. Many attempts have been made to isolate a specific bacillus as the causative factor in this frightful disease, but without success. The streptococcus and staphylococcus are always present but are not the true cause of this mixed infection.

Schimmelbusch, in 1889, found a large number of short rods, with round extremities, often in chains, and in twos, and sometimes prolonged, which stained with the Gram stain. They were easily cultivated on gelatin and developed colonies. Inoculation into animals caused abscesses but never necrosis. In the author's case similar rods were found in the gangrenous tissues, but never in the blood of the patient, and tubes inoculated from this blood remained absolutely sterile. The author does not believe that this is the specific agent of the disease.

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